

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

اختبار شهر ابريل





Choose the correct answer for the questions 1 : 20

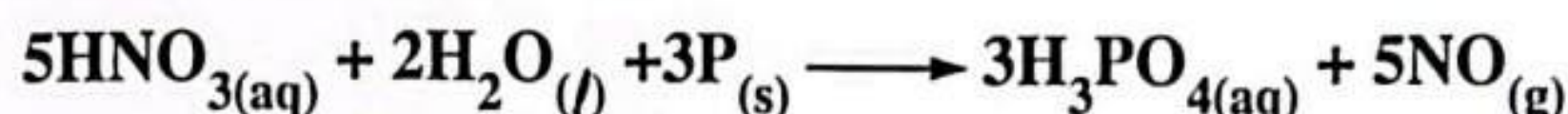
20 marks



- 1 The compound which is added to some plastic and wood products to increase its resistance to burning is

(a) P_2O_5 (b) GaAs (c) RbBr (d) Sb_2O_3

- 2 In terms of the redox reaction :



Which of the following statements is correct ?

- (a) Phosphorus acts as the oxidizing agent.
 (b) The used nitric acid acts as a reducing agent.
 (c) Oxidation number of nitrogen in HNO_3 equals that of phosphorus in H_3PO_4
 (d) NO gas is similar to NO_2 gas in the oxidation number.

- 3 Which of the following salts its cation gives a green colour during flame test ?

(a) LiF (b) NaF (c) KCl (d) $BaCl_2$

- 4 Nitrogen gas and ammonia gas are similar in that they both

- (a) have characteristic odours. (b) are sparingly soluble in water.
 (c) have neutral effect on litmus dye. (d) are lighter than air.

- 5 When the solid substance (X) is placed in the acid (Y), a chemical reaction begins and stops instantly.

Which of the following represents the substance (X) and the acid (Y) ?

- (a) (X) : Chromium / (Y) : Conc. nitric acid.
 (b) (X) : Iron / (Y) : Dil. nitric acid.
 (c) (X) : Copper / (Y) : Conc. nitric acid.
 (d) (X) : Sodium carbonate / (Y) : Dil. nitric acid.

- 6 Four consecutive elements in the second period in the periodic table are respectively A , B , C and D, if the element C is a halogen.

What are the two elements which form together several different compounds ?

(a) A , B (b) B , C (c) C , D (d) D , A

7 The two major components of atmospheric air react together at suitable conditions to form

- (a) NH_3 (b) NO (c) H_2O (d) P_2O_5

8 Which of the following reactions is accompanied by explosion ?

- (a) $\text{Na}_2\text{O}_{2(s)} + 2\text{HCl}_{(aq)} \longrightarrow 2\text{NaCl}_{(aq)} + \text{H}_2\text{O}_{2(l)}$
 (b) $3\text{Mg}_{(s)} + \text{N}_{2(g)} \xrightarrow{\Delta} \text{Mg}_3\text{N}_{2(s)}$
 (c) $2\text{Cu}_{(s)} + \text{O}_{2(g)} \xrightarrow{\Delta} 2\text{CuO}_{(s)}$
 (d) $2\text{Na}_{(s)} + \text{Cl}_{2(g)} \longrightarrow 2\text{NaCl}_{(s)}$

9 A student carried out this reaction : $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}_{(s)} \xrightarrow{\Delta} \text{Na}_2\text{CO}_{3(s)} + 10\text{H}_2\text{O}_{(v)}$ then he wrote these notes :

- (1) : Anhydrous sodium carbonate is formed.
 (2) : Water vapour evolves as a product of this reaction.
 (3) : The aqueous solution of the hydrated compound is acidic.

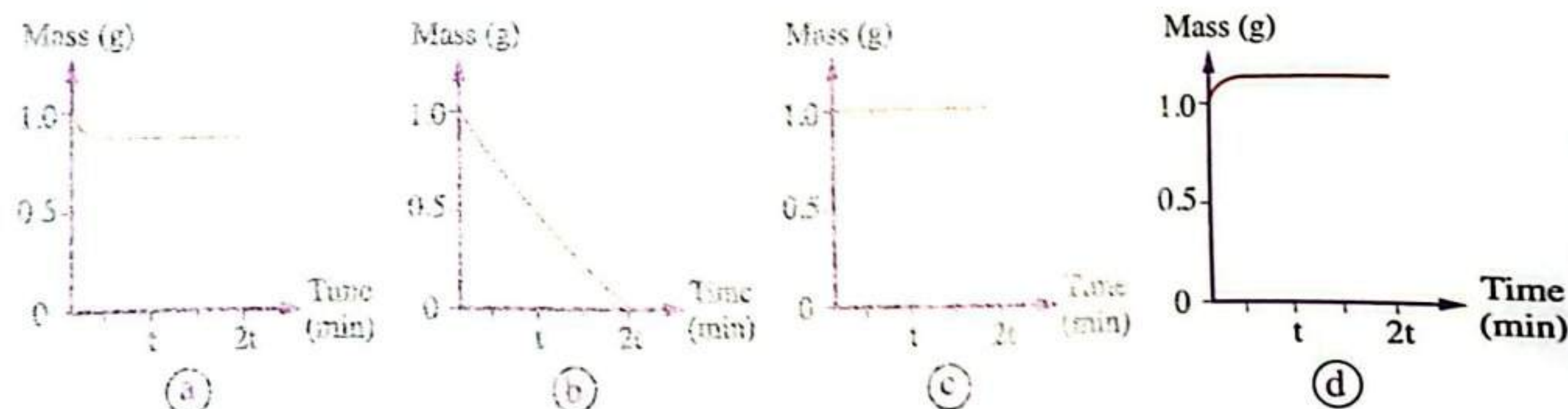
Which of the following represents the correct observations ?

- (a) (1) and (3) only. (b) (1) and (2) only.
 (c) (2) and (3) only. (d) (1) , (2) and (3).

10 All the following are properties of rubidium element, except

- (a) it reacts with water yielding hydrogen gas.
 (b) it can be divided into smaller pieces by knife.
 (c) it conducts electricity.
 (d) it reacts with chlorine gas forming RbCl_2

11 Which graph does represent the change in the mass of 1 g sodium nitrate after strong heating ?



12 What is the correct classification of cesium oxide ?

- (a) Strong base. (b) Weak base. (c) Acidic oxide. (d) Amphoteric oxide.

- 13 Dilute nitric acid is a strong oxidizing agent, it reacts with iron by heating yielding iron nitrate solution, an oxide of nitrogen and water.

What is the oxidation number of iron in the produced iron nitrate ?

- (a) +1 (b) +2 (c) +3 (d) +4

- 14 All the following compounds are similar in the oxidation number of oxygen, except

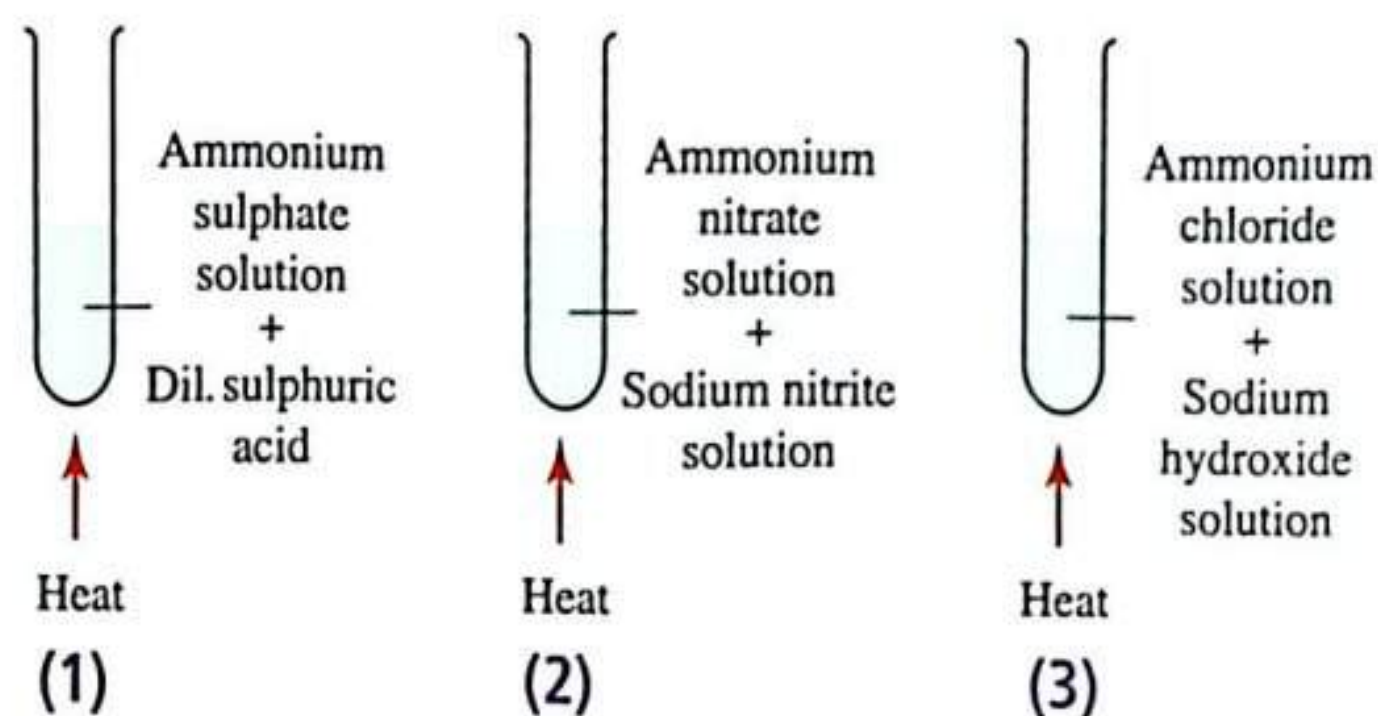
- (a) K_2CO_3 (b) K_2O (c) KOH (d) KO_2

- 15 Sodium carbonate is similar to lithium carbonate in

- (a) the gas produced from the reaction with acids.
(b) the melting point.
(c) the colour formed during the dry test.
(d) the effect of the strong heat.

- 16 Which of the methods illustrated in the opposite figures is (are) used in preparing ammonia gas ?

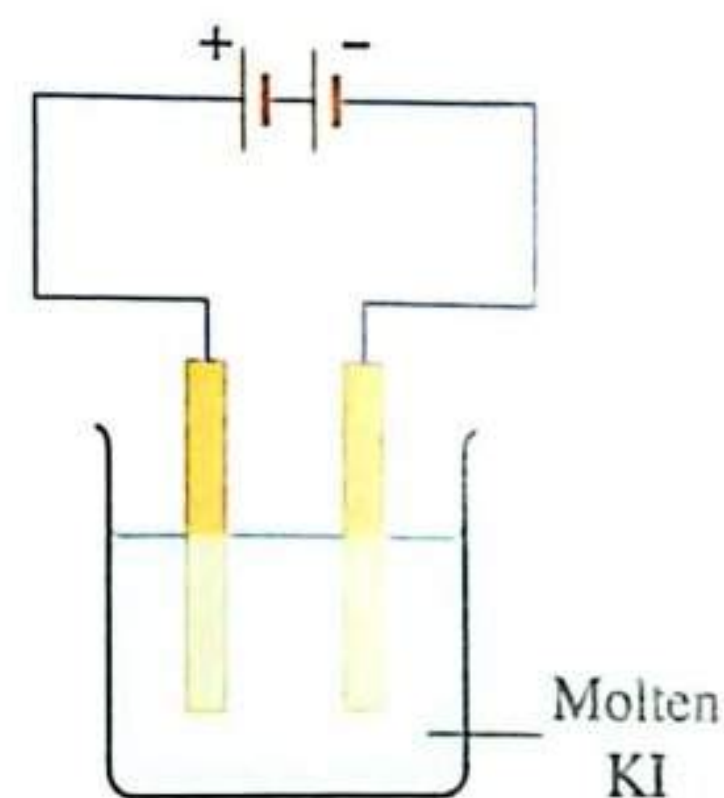
- (a) (1).
(b) (2).
(c) (3).
(d) (1) and (2).



- 17 The figure illustrates the electrolytic cell of molten potassium iodide.

Which of the following reactions occurs at the anode ?

- (a) $2K_{(l)}^+ + 2e^- \longrightarrow 2K_{(s)}$
(b) $2K_{(s)} \longrightarrow 2K_{(l)}^+ + 2e^-$
(c) $2I_{(l)}^- \longrightarrow I_{2(s)} + 2e^-$
(d) $I_{2(s)} + 2e^- \longrightarrow 2I_{(l)}^-$



- 18 Which of the following represents the first and the second ionization potentials of sodium respectively ?

- (a) 1680 kJ/mol / 2000 kJ/mol (b) 4500 kJ/mol / 450 kJ/mol
(c) 496 kJ/mol / 4563 kJ/mol (d) 737 kJ/mol / 1000 kJ/mol

19 Which of the following substances reacts with water forming an alkaline solution and a basic gas ?

(a) LiH

(b) Na

(c) Na_2O_2

(d) Li_3N

20 When sodium is burnt in excess oxygen gas, compound (X) is formed which can react with hydrochloric acid forming the products (Y).

Which of the following identifies (X) and (Y) ?

(a) (X) : Na_2O , (Y) : $\text{NaCl} + \text{H}_2\text{O}$

(b) (X) : Na_2O_2 , (Y) : $\text{NaCl} + \text{H}_2\text{O}_2$

(c) (X) : NaO_2 , (Y) : $\text{NaCl} + \text{H}_2\text{O}_2 + \text{O}_2$

(d) (X) : NaO , (Y) : NaOH

Answer the essay questions 21 : 23

4 marks

21 A gaseous nonmetal its oxidation numbers range between $(-3 : +5)$.

Conclude the product of dissolving the hydride compound of this element in water.

.....
.....

1 mark

22 What is the probable change in the mass of a sample of sodium hydroxide crystals when it is left exposed to atmospheric air for several days ? Explain.

.....
.....

1 mark

23 Calcium nitride reacts with water forming what is known as slaked lime and another gaseous compound :

(1) Write the balanced symbolic equation which represents this reaction.

.....

(2) How can this gas be detected ?

.....

2 marks

Questions

Chapter 3

Lesson One

Answered

Questions for Al-Azhar students ?

1 Write the scientific term of each of the following statements :

- (1) The sum of the numbers of protons and neutrons inside the nucleus of the element atom.
- (2) The atoms of the same element which have the same atomic number, but differ in the mass number.
- (3) The isotopes which do not emit any radiations.
- (4) The isotopes whose nuclei are unstable.
- (5) The energy required to overcome the electrostatic repulsive forces found between the protons inside the nucleus.

2 To whom are the following attributed :

- (1) Called the phenomenon of the emission of invisible radiations from any uranium compound the radioactivity.
- (2) Called the sum of the numbers of the protons and the neutrons the mass number.
- (3) Directed the first artificial chain reaction.

3 Fill in the blanks in the following tables:

(1) Isotope	.....	Tritium	.....
Atomic number	.....	1	.....
Number of nucleons	2	.....	.....
Number of neutrons	1	.....	.....

(2) Elements	^{23}Na	Y	Sn	Au
Number of protons	.....	39	.....	79
Number of neutrons	.....	50	.....	.....
Number of electrons	11	.....	50	.....
Number of nucleons	.....	.....	118	197

4 Complete the following statements:

- (1) discovered the phenomenon of the radioactivity, while discovered the neutrons.
- (2) The nucleons are the sum of and
- (3) The isotopes have the same number, but differ in the number.
- (4) Uranium - 235 is isotope, while oxygen - 16 is isotope.

- (5) ray is deviated towards the positive electrode, while ray is not affected by electric fields.
- (6) During the nuclear reactions, converts into
- (7) The stability of the nucleus increases by increasing the energy per

5 What is meant by :

- (1) Nucleons. (2) Isotopes. (3) Nuclear binding energy.

6 Compare between alpha, beta and gamma emissions

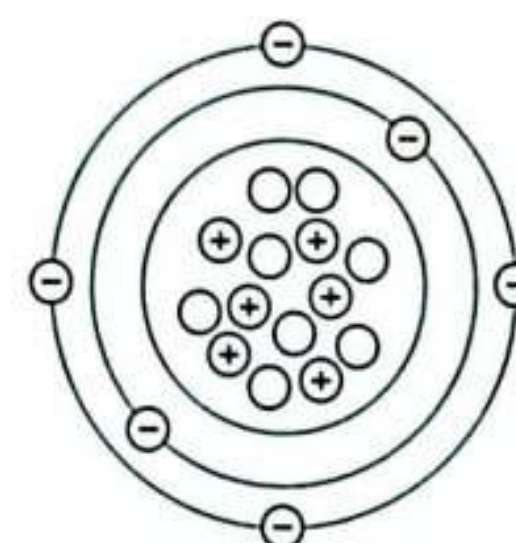
(In terms of : Nature – Charge – Effect of the electric field).

Questions for the general stream and Al-Azhar students ?

Multiple choice questions (MCQ)

Historical introduction

- 1** The radioactivity phenomenon of uranium was named by this name because the radiation
- (a) appears upon heating uranium compounds.
 (b) is emitted spontaneously from uranium compounds.
 (c) emitted from uranium compounds is visible.
 (d) emitted from it does not affect the photographic plates.
- 2** Nucleons represent both
- (a) protons and electrons. (b) protons and neutrons.
 (c) positrons and electrons. (d) alpha particles and beta particles.
- 3** What is the number of nucleons found in the nucleus of thorium ${}_{90}^{234}\text{Th}$?
- (a) 90 (b) 144 (c) 234 (d) 236
- 4** The mass number of an element atom is 55 and its atomic number is 25, hence its number of nucleons is
- (a) 25 (b) 30 (c) 55 (d) 80
- 5** The number of nucleons in this shown atom is
- (a) 6
 (b) 8
 (c) 14
 (d) 20



- 6 The chemical symbol of the nucleus of chlorine atom which contains 17 protons, 18 neutrons is
- (a) $^{18}_{35}\text{Cl}$ (b) $^{35}_{18}\text{Cl}$ (c) $^{17}_{35}\text{Cl}$ (d) $^{35}_{17}\text{Cl}$
- 7 Which of the following are the components of a nucleus of an element atom whose atomic number is 26 and its mass number is 56 ?
- (a) 26 neutrons and 30 protons. (b) 30 neutrons and 26 protons.
(c) 56 neutrons and 26 protons. (d) 26 neutrons and 56 protons.
- 8 What is the number of neutrons (N) found in the nucleus of the atom ^X_YA ?
- (a) $N = X$ (b) $N = Y$ (c) $N = X - Y$ (d) $N = X + Y$
- 9 Which of the following pairs of elements atoms their nuclei contain the same number of neutrons ?
- (a) $^{12}_5\text{B}$, $^{12}_6\text{C}$ (b) ^1_1H , ^2_1H (c) $^{12}_6\text{C}$, $^{13}_7\text{N}$ (d) $^{14}_6\text{C}$, $^{14}_7\text{N}$
- 10 How many nucleons are found in an atom nucleus containing 12 neutrons and the energy level M in this atom contains one electron?
- (a) 12 (b) 13 (c) 23 (d) 24
- 11 How many nucleons are found in the nucleus of an ion whose charge is +2 and possesses 10 electrons, 14 neutrons ?
- (a) 14 (b) 22 (c) 24 (d) 26
- 12 If the ion (Y) contains 10 electrons and 10 neutrons. What is the symbol of the element (Y) ?
- (a) $^{19}_9\text{Y}$ (b) $^{19}_{10}\text{Y}$ (c) $^{20}_9\text{Y}$ (d) $^{20}_{10}\text{Y}$

Isotopes

- 13 The isotopes of the same element are similar in the following, except
- (a) number of protons. (b) number of electrons.
(c) physical properties. (d) chemical properties.
- 14 The isotopes of the same element must be
- (a) different in the number of electrons. (b) similar in the number of neutrons.
(c) different in the number of nucleons. (d) similar in the mass number.
- 15 The isotope of the element $^{112}_{50}\text{X}$ is
- (a) $^{112}_{51}\text{X}$ (b) $^{113}_{51}\text{X}$ (c) $^{112}_{49}\text{X}$ (d) $^{113}_{50}\text{X}$

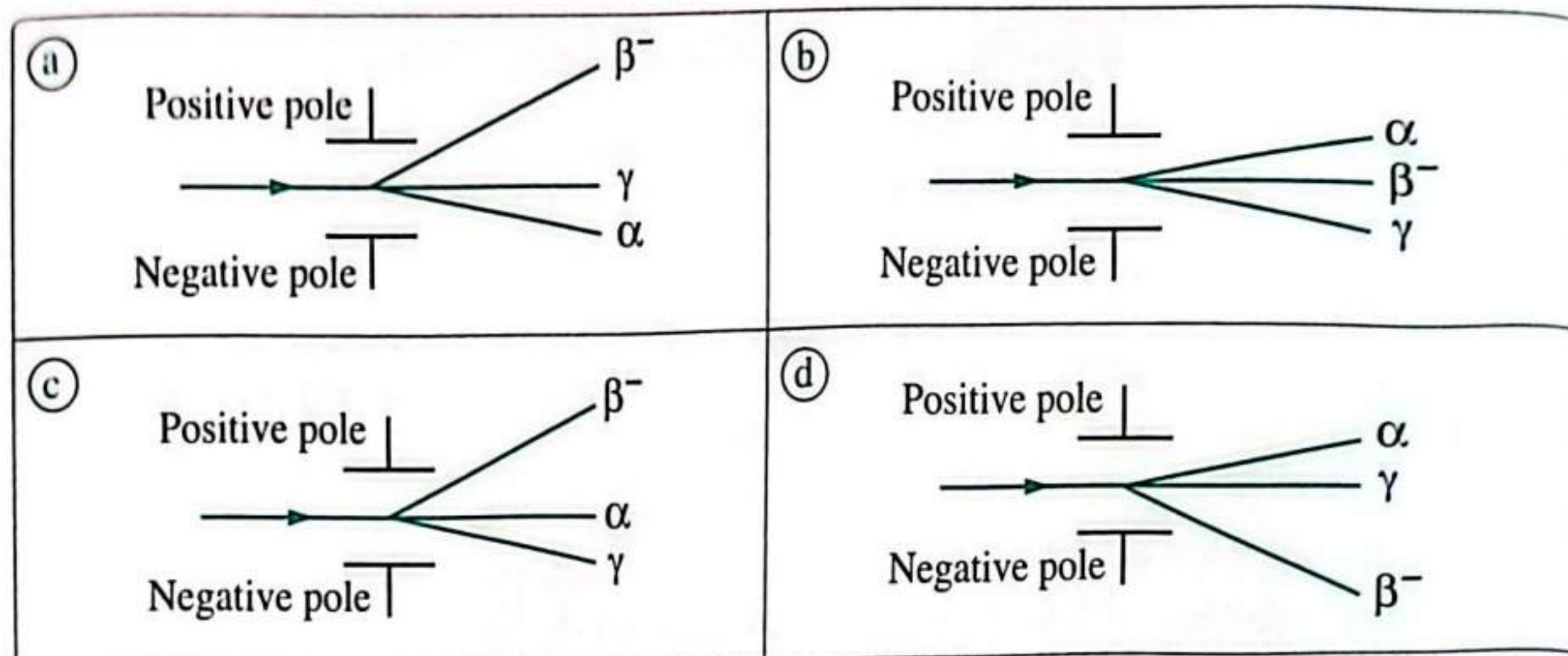
- 16** The isotope chlorine -37 differs from chlorine -35 in containing higher number of
- (a) neutrons and electrons. (b) protons and electrons.
(c) neutrons only. (d) protons only.
- 17** The nucleus of each of the following contains neutrons, except
- (a) deuterium. (b) protium.
(c) tritium. (d) triton.
- 18** Number of neutrons is double the number of protons in the nucleus of
- (a) protium. (b) deuterium.
(c) tritium. (d) proton.
- 19** The atomic number of iron is 26 and it has 4 isotopes,
all these isotopes have the same chemical properties, as they have the same
- (a) mass number. (b) number of nucleons.
(c) number of neutrons. (d) number of electrons in the last energy level.

Types of radiations

- 20** Among the examples of the stable isotopes are
- (a) oxygen - 16 and sodium - 23 (b) uranium - 235 and oxygen - 18
(c) oxygen - 16 and cobalt - 60 (d) sodium - 22 and uranium - 238
- 21** Which of the following has both the nature and the charge of an electron?
- (a) Alpha particle. (b) Beta particle.
(c) Gamma ray. (d) X - ray.
- 22** Which of the following describes gamma rays?
- (a) Positively charged. (b) Negatively charged.
(c) High speed electrons. (d) High energy photons.
- 23** Each of the following is affected by the electric field, except
- (a) alpha radiation. (b) positrons.
(c) beta radiation. (d) gamma radiation.
- 24** Among the charged emissions are
- (a) alpha and gamma. (b) alpha and beta.
(c) gamma only. (d) beta only.

- 25 A beam of particles is emitted from a radioactive element and passes through two poles of an electric field.

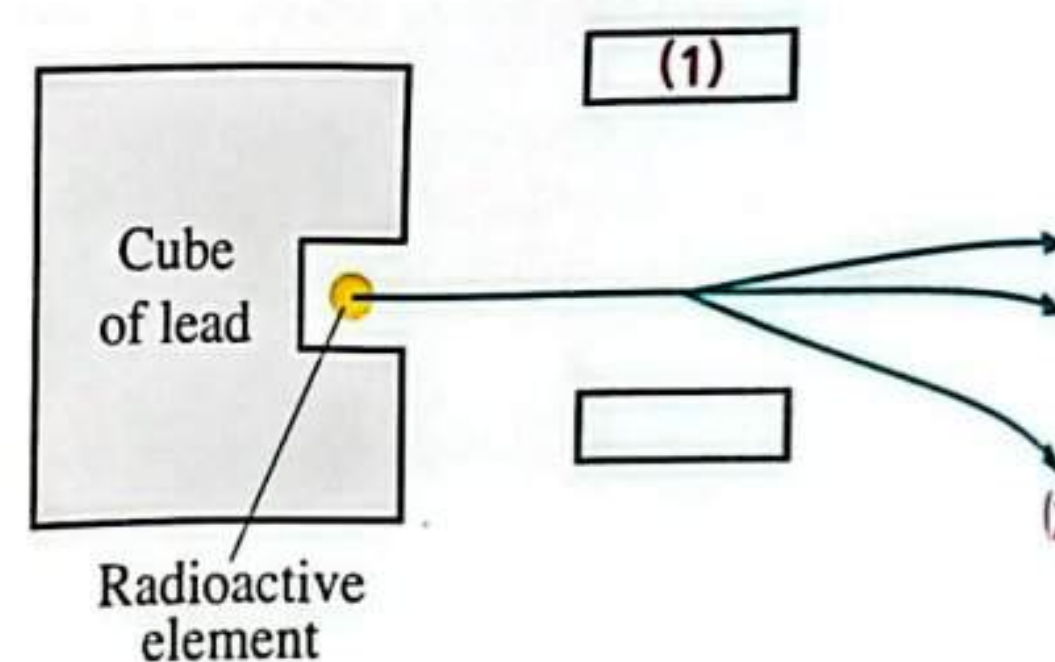
Which of the following choices expresses the correct path of the particles ?



- 26 The opposite figure represents three types of rays passing through an electric field.

Which of the following represents (1) and (2) ?

- (a) Negative electrode / Alpha radiation.
 (b) Negative electrode / Beta radiation.
 (c) Positive electrode / Alpha radiation.
 (d) Positive electrode / Beta radiation.



Calculations of the conversion of mass into energy

- 27 Each of the following is a measuring unit of energy, except

- (a) MeV (b) J (c) amu (d) kJ

- 28 The energy produced from the conversion of 1 u into energy =

- (a) 931×10^6 MeV (b) 931 MeV
 (c) 1.489×10^{-10} MeV (d) 1.545×10^{-24} MeV

- 29 0.00234 u mass converts into energy equals

- (a) 2.179 MeV (b) 5.146 MeV
 (c) 9.302 MeV (d) 13.541 MeV

- 30 How much energy is produced on the conversion of 3 g of a substance ?

- (a) 27×10^{15} MeV (b) 0.27×10^{12} J
 (c) 2.7×10^{14} J (d) 27×10^{13} MeV

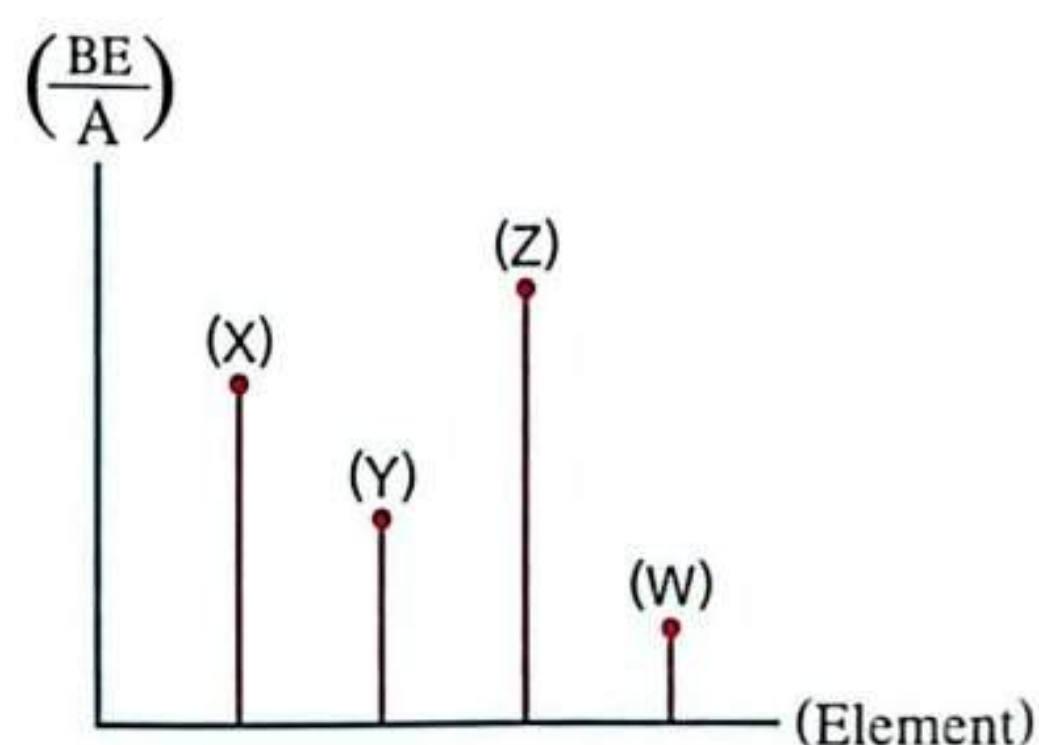
- 31 How much energy is produced when 80% of 10 g sample of an element are converted ?
- (a) 9.5×10^{-24} MeV (b) 9.5×10^{-27} MeV
(c) 4.5×10^{27} MeV (d) 4.5×10^{24} MeV

- 32 The mass converted into a quantity of energy equals 7×10^2 MeV is
- (a) 700 u (b) 0.7519 u (c) 75 u (d) 7.51879 u

Nuclear binding energy

- 33 The mass of the combined nucleons is called
- (a) the theoretical mass. (b) the mass number.
(c) the actual mass. (d) the calculated mass.
- 34 When the nuclear binding energy per nucleon is high, so the nucleus of such isotope
- (a) is not completely stable. (b) is very stable.
(c) has actual mass > theoretical mass. (d) has actual mass = theoretical mass.

- 35 The graphical figure represents the nuclear binding energy per each nucleon (in MeV) for 4 different elements. Which of these elements is the most stable ?



- (a) (Z).
(b) (W).
(c) (X).
(d) (Y).
- 36 If the nuclear binding energy in helium nucleus ${}^4_2\text{He}$ is 28 MeV, then the binding energy per nucleon equals
- (a) 7 MeV (b) 14 MeV (c) 56 MeV (d) 112 MeV
- 37 If you know that the actual mass of deuterium (${}^2_1\text{H}$) = 2.014102 u, mass of proton = 1.0073 u and mass of neutron = 1.0087 u
What is the binding energy of deuterium in MeV ?
- (a) 1.77 MeV (b) 1.388 MeV (c) 2.73 MeV (d) 3.78 MeV
- 38 If the difference between the sum of the masses of the free nucleons and that of the bound nucleons in the nucleus of iron atom ${}^{56}_{26}\text{Fe}$ is 0.5 u
What is the nuclear binding energy in the nucleus of iron atom in million electron volts ?
- (a) 655.4 MeV (b) 545.6 MeV (c) 465.5 MeV (d) 353.1 MeV

- 39 What is the mass which is converted to bind the components of the nucleus of helium atom (${}^4_2\text{He}$), knowing that the nuclear binding energy per nucleon in it equals 7.070945 MeV ?
- (a) 1.0713 u (b) 0.03038 u (c) 3.1033 u (d) 9.9789 u
- 40 The mass of the binded nucleons in the nucleus of ${}^{65}_{29}\text{Cu}$ equals 64.9528 u
What is the mass of these nucleons of the same nucleus when they are free (not bound) ?
- (a) 64.9528 u (b) 64.3174 u (c) 63.5 u (d) 65.5228 u
- 41 The mass of a proton equals 1.0073 u and the mass of a neutron equals 1.0087 u
What is the actual mass of tritium nucleus ?
- (a) 3.016 u (b) 3.2046 u (c) 3.0247 u (d) 5.03 u
- 42 If you know that the binding energy in the nucleus of one of nitrogen isotopes is 90.8656 MeV and its actual mass is 13.0057 u
What is the theoretical mass of a nucleus of this isotope ?
- (a) 11.3301 u (b) 12.3013 u (c) 13.1033 u (d) 13.3031 u
- 43 What is the mass number of an isotope of an element whose nuclear binding energy (BE) is 342 MeV and the nuclear binding energy per nucleon in its nucleus is 8.55 MeV ?
- (a) 20 (b) 22 (c) 40 (d) 44

Essay questions

- 44 Give reasons for :
- (1) The isotopes have the same chemical properties, but exhibit different physical properties.
 - (2) Both the atomic number and the mass number of protium isotope are equal.
 - (3) Both uranium - 235 and uranium -238 are isotopes of uranium.
 - (4) The mass of the atom is concentrated in the nucleus.
 - (5) The difference of the nature of alpha particle from that of beta particle.
 - (6) The difference of the behaviour of alpha emission from that of beta emission during their passage through an electric field.
 - (7) The actual mass of helium nucleus is less than its theoretical mass.
 - (8) The difference of oxygen -18 isotope from oxygen -16 isotope in the nuclear stability.

45 Write the chemical symbol of the nuclei of each of the following isotopes :

- (1) Element X ($A = 65$, $Z = 29$).
- (2) Element Y ($N = 25$, $Z = 20$).
- (3) Element Z ($A = 84$, $N = 48$).

46 An atom of one of sodium isotopes contains :

(11 protons , 11 electrons , 13 neutrons)

- (1) Which of the previous numbers does not change in sodium isotopes ?
- (2) What is the number of nucleons in this isotope ?

47 Calculate the amount of energy produced from the conversion of 0.2 g of a substance into energy measured in :

- (1) Joules (J).
- (2) Million electron volts (MeV).

48 Calculate the amount of energy produced from the conversion of 50% of 10 g of a radioactive substance, measured in :

- (1) Joules (J).
- (2) Million electron volts (MeV).

49 Calculate the mass which converts into 9.31 MeV

50 If you know that the mass defect in the nucleus of ($^{14}_7\text{N}$) isotope = 0.115 u, and in that of ($^{15}_7\text{N}$) isotope = 0.105 u
Which of them is more stable ? Explain.

51 Calculate the actual mass of the nucleus of nitrogen $^{14}_7\text{N}$, knowing that :

- Nuclear binding energy per nucleon = 6.974 MeV
- Proton mass = 1.0073 u
- Neutron mass = 1.0087 u

52 Calculate the mass of ($^{24}_{12}\text{Mg}$) nucleus after binding its components, since :

BE = 192.717 MeV, mass of proton = 1.0073 u and mass of neutron = 1.0087 u

53 Calculate the mass of the free nucleons in the nucleus of one of cobalt isotopes, knowing that its actual mass = 60.93244 u and BE = 521.788 MeV

Questions

Chapter 3

Lesson Two

Answered

Questions for Al-Azhar students ?

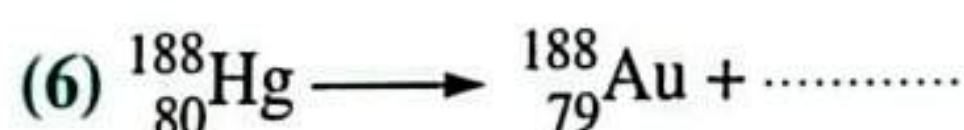
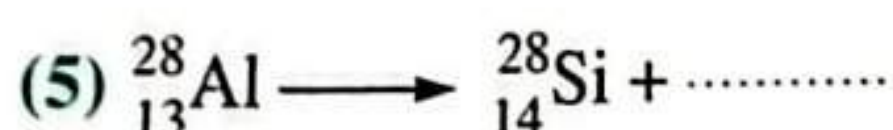
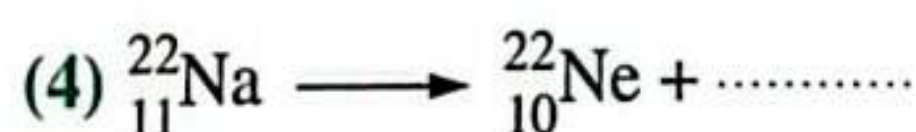
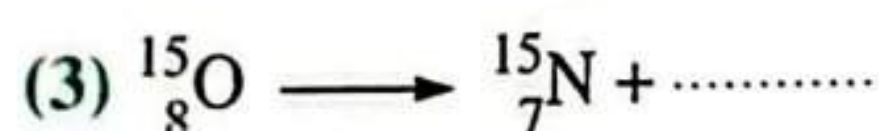
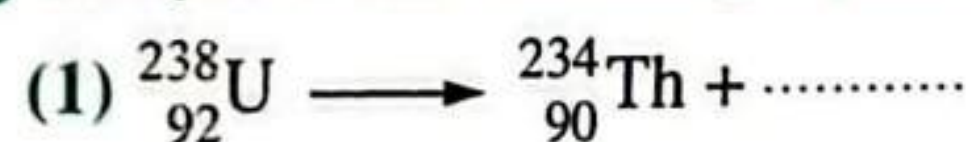
1 Write the scientific term of each of the following statements :

- (1) The changes occurring in a nucleus of an element atom, which lead to its transformation into a nucleus of a new element.
- (2) The emission of radiations from the nuclei of the radioactive elements spontaneously.
- (3) A radiation with charge (+2) and has the same composition of helium nucleus.
- (4) A radiation with charge (-1) and is known as the nucleus electron.
- (5) A radiation with charge (+1) and is similar to the negative beta particle in the mass, but with a positive charge.
- (6) A radiation that has no mass or charge, as they are photons.
- (7) The time required for the disintegration of half the number of the nuclei of the radioactive element.
- (8) A technological application that triggers loud alarm to provide early warning of fire.

2 Complete the following statements :

- (1) The emission of particle from the nucleus of a radioactive element results in the formation of a daughter element whose atomic number is less by 2 than the parent element, while its mass number is less by
- (2) is known as the negative beta particle or
- (3) The atomic number of the daughter element formed through the emission of one negatron is less by than the parent element, while its mass number is the same.
- (4) The positron is formed through the transformation of a into a
- (5) When a parent element is transformed into a daughter element through the emission of one, its atomic number is by, while its mass number is the same.
- (6) rays are photons with no or charge.
- (7) The number of nuclei of the radioactive element decreases to after each
- (8) isotope which emits α -particles is used in smoke alarms.

3 Complete the following equations :



4 What are the results of the emission of each of the following radiations from the nuclei of the parent elements :

- (1) Alpha. (2) Negatron. (3) Positron. (4) Gamma.

5 Illustrate with nuclear equations the effects of the emission of :

- (1) α -particle from the nucleus of ${}^{238}_{92}\text{U}$
 (2) α -particle from the nucleus of ${}^{227}_{89}\text{Ac}$
 (3) β^- -particle from the nucleus of ${}^{14}_6\text{C}$
 (4) β^- -particle and a positron from the nucleus of ${}^{22}_{11}\text{Na}$
 (5) β^- -particle and gamma rays from the nucleus of ${}^{60}_{27}\text{Co}$

6 Give reasons for the following :

- (1) Alpha particle is different from helium atom, although they both have the symbol ${}^4_2\text{He}$
 (2) The negative beta particle is called the nucleus electron.
 (3) Emission of a positron from the nucleus of a radioactive element is accompanied by natural transmutation.
 (4) Emission of gamma rays from the nucleus of a radioactive element is not accompanied by natural transmutation.
 (5) Fixing the smoke alarm in the room ceiling.

Questions for the general stream and Al-Azhar students ?

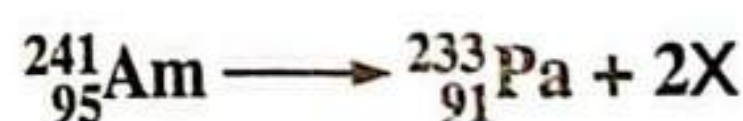
Multiple choice questions (MCQ)

Natural transmutation of elements

1 The nucleus produced from the decaying of ${}^A_Z\text{X}$ atom by the emission of an alpha particle is

- (a) ${}^{A-4}_{Z-2}\text{Y}$ (b) ${}^{A+4}_{Z+2}\text{Y}$ (c) ${}^{A-2}_{Z-4}\text{Y}$ (d) ${}^{Z-2}_{A-2}\text{Y}$

2 In the opposite nuclear reaction :
What is the particle X ?



- (a) Alpha. (b) Beta. (c) Neutron. (d) Positron.

3 Uranium -238 is characterized by the emission of an alpha particle forming the nucleus of

- (a) uranium -238 (b) thorium -234
 (c) uranium -234 (d) thorium -238

- 4 Emission of an α -particle from the nucleus of radium -226 forms
- (a) radon -220 (b) radon -222 (c) thorium -232 (d) thorium -228
- 5 Thorium ${}_{90}^{226}\text{Th}$ can be transformed to polonium ${}_{84}^{214}\text{Po}$ spontaneously.
What is the number of α -particles which accompany this transformation ?
- (a) 1 (b) 2 (c) 3 (d) 4
- 6 A nucleus of a radioactive element (X) lost 5 alpha particles and transformed to the nucleus of element (Y), which contains 80 protons and 126 neutrons.
The numbers of each of A and Z of the nucleus of element (X) are respectively
- (a) 216 , 90 (b) 226 , 90 (c) 216 , 94 (d) 226 , 94
- 7 Which of the following two particles both have nearly the same mass ?
- (a) Alpha particle and beta particle. (b) Alpha particle and proton.
(c) Neutron and positron. (d) Neutron and proton.
- 8 Which of the following has the nature and the charge of the electron ?
- (a) Alpha particle. (b) Negatron. (c) Gamma ray. (d) X-ray.
- 9 Which of the following yields a negative beta particle when being transformed to a proton ?
- (a) ${}^1_1\text{H}$ (b) ${}^4_2\text{He}$ (c) ${}^1_0\text{n}$ (d) e^-
- 10 The positron is formed through the transformation of
- (a) a proton to a neutron. (b) a neutron to a proton.
(c) a proton to an electron. (d) a neutron to an electron.
- 11 Element (L) is transformed into element (M), according to the opposite nuclear equation : ${}^A_Z\text{L} \longrightarrow {}^A_{Z+1}\text{M} + \text{X}$
What is the particle (X) ?
- (a) Alpha particle. (b) Beta particle.
(c) Neutron. (d) Nucleus of helium atom.
- 12 What is the number of the electrons in the valence shell of the element whose nucleus is formed by emitting a negatron from the nucleus of the atom of sodium isotope ${}^{24}_{11}\text{Na}$?
- (a) 1e^- (b) 2e^- (c) 6e^- (d) 7e^-

13 $^{53}_{24}\text{Cr}$ is produced from the emission of a negatron from

- (a) $^{53}_{25}\text{Mn}$ (b) $^{54}_{24}\text{Cr}$ (c) $^{52}_{24}\text{Cr}$ (d) $^{53}_{23}\text{V}$

14 Which of the following choices represents the product X

in the equation : $^{236}_{92}\text{U} \longrightarrow 4^1_0\text{n} + ^{136}_{53}\text{I} + \text{X} ?$

- (a) $^{98}_{41}\text{Nb}$ (b) $^{96}_{38}\text{Sr}$ (c) $^{96}_{39}\text{Y}$ (d) $^{98}_{40}\text{Zr}$

15 The nucleus produced from the decay of the nucleus of element ^A_ZX atom by emission of one α -particle then one β^- -particle is represented by

- (a) $^{A-4}_Z\text{X}$ (b) $^{A-1}_{Z-4}\text{Y}$ (c) $^{A-4}_{Z-1}\text{Y}$ (d) $^{A-4}_{Z-2}\text{Y}$

16 When $^{238}_{92}\text{U}$ loses 1 α -particle, then 2 β^- -particles and γ -rays, it is transformed into

- (a) $^{236}_{92}\text{U}$ (b) $^{238}_{90}\text{Th}$ (c) $^{234}_{91}\text{Pa}$ (d) $^{234}_{92}\text{U}$

17 Which of the following properties matches γ -rays ?

- (a) They have positive charge. (b) They have negative charge.
(c) They are electrons. (d) They are photons.

Half - life

18 From the opposite table :

What is the half-life of this element ?

- (a) 10 min
(b) 20 min
(c) 40 min
(d) 60 min

Number of the remaining nuclei	Time (min)
800	0
560	10
400	20
280	30
200	40
140	50
100	60

19 On putting a radioactive source in front of Geiger counter, the rate of counting decreases from 4000 CPM (counts per minute) to 500 CPM within 72 min
What is the half-life of this radioactive element ?

- (a) 8 min (b) 9 min (c) 18 min (d) 24 min

20 87.5% of a radioactive element decayed after 15 days.

What is the half-life of this radioactive element ?

- (a) 5 days. (b) 12.5 days. (c) 15 days. (d) 87.5 days.

- 21 After passing 48 hours for a sample of a radioactive element, $\frac{1}{16}$ of it remained unchanged.
What is the half-life of this element ?
(a) 3 h (b) 9.6 h (c) 12 h (d) 24 h
- 22 A sample of a radioactive element its mass is 4.8 g, if this element has a half-life $(t_{\frac{1}{2}}) = 2$ years.
What is the mass of the nuclei of this element which decayed after 8 years ?
(a) 0.3 g (b) 2.4 g (c) 4.2 g (d) 4.5 g
- 23 After passing 1 year, a sample of a radioactive element now contains 0.3×10^{12} atoms.
How many atoms was found in this sample before decaying, if its half life time is 3 months ?
(a) 0.6×10^{12} atoms. (b) 1.2×10^{12} atoms.
(c) 2.4×10^{12} atoms. (d) 4.8×10^{12} atoms.
- 24 A radioactive element whose mass equals 64 g and its half-life equals 4 months.
What is the mass of this element which remains after passing one year ?
(a) 8 g (b) 16 g (c) 32 g (d) 46 g
- 25 The half life time of radioactive iodine is 8 days, there is a sample of it contains x atoms.
What is the number of its atoms which remained without decaying after 24 days ?
(a) $\frac{1}{2} x$ (b) $\frac{1}{4} x$ (c) $\frac{1}{8} x$ (d) $\frac{1}{16} x$
- 26 A sample of a radioactive element, its half-life is 2 years, contains 4.8×10^{12} atoms.
How many atoms (nuclei) are decayed after 8 years ?
(a) 2.4×10^{12} atoms. (b) 4.2×10^{12} atoms.
(c) 3.6×10^{12} atoms. (d) 4.5×10^{12} atoms.
- 27 Which of the following can be the time required for the disintegration of 53.125% of the nuclei of a radioactive element its half-life is 32 min ?
(a) 64 min (b) 34 min (c) 30 min (d) 21 min
- 28 A sample of a radioactive element its half life time is 4 min
The remaining percentage of this sample after 480 seconds is
(a) 10% (b) 25% (c) 50% (d) 75%

- 29 The half-life of a radioactive element = 2 days, the number of its atoms' nuclei decreases to $\frac{1}{8}$ of its original number after
- (a) 4 days. (b) 6 days. (c) 8 days. (d) 16 days.
- 30 What is the time required for decaying $\frac{3}{4}$ of the mass of a radioactive element whose mass = 32 g and its half-life is 3 years ?
- (a) 2 years. (b) 4 years. (c) 6 years. (d) 12 years.
- 31 The smoke alarm contains
- (a) americium -241 (b) uranium -235 (c) nitrogen -14 (d) magnesium -24
- 32 What is the effect of the smoke when it reaches the sensor of the smoke alarm ?
- (a) It decreases the intensity of the light falling on the light cell.
 (b) It hinders the ionization of air molecules.
 (c) It emits visible light.
 (d) It absorbs the sound of the alarm.

Essay questions

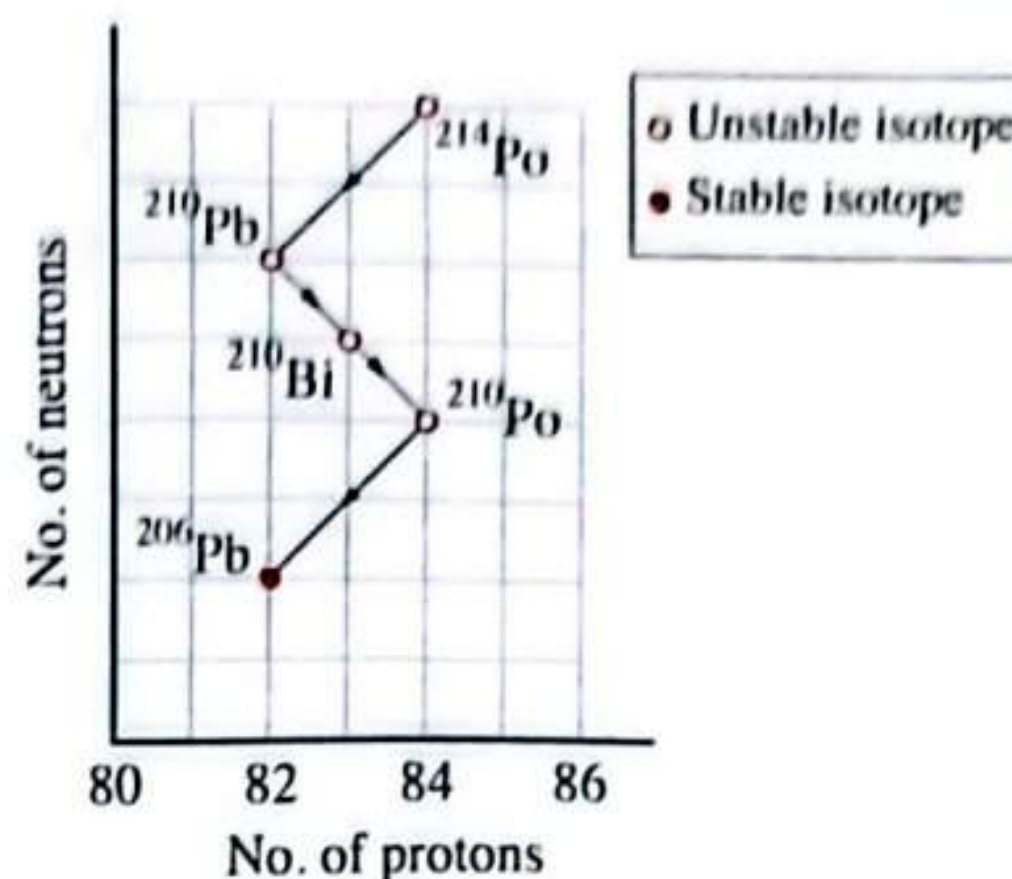
Natural transmutation of elements

- 33 Calculate the number of α -particles emitted from ${}_{90}^{228}\text{Th}$ to be transformed into ${}_{84}^{216}\text{Po}$
- 34 A negatron is emitted from the nucleus of antimony ${}_{51}^{117}\text{Sb}$ atom forming the nucleus of tellurium atom (Te).
 Write the nuclear equation that represents this emission.
- 35 The nucleus of technetium ${}_{43}^{99}\text{Tc}$ emits one beta particle and one neutron and is transformed into a nucleus of ruthenium.
 Represent this natural transformation with a balanced nuclear equation.
- 36 Illustrate by nuclear equations each of the following :
- (1) Emission of α -particle from ${}_{95}^{241}\text{Am}$ to form the daughter element (X).
 - (2) Emission of negatron from ${}_{15}^{32}\text{P}$ to form the daughter element (X).
 - (3) Emission of positron from ${}_{19}^{38}\text{K}$ to form the daughter element (X).
 - (4) Emission of negative beta particle and gamma from ${}_{7}^{13}\text{N}$ to form the daughter element (X).

37 The opposite figure shows the number of protons and neutrons of some isotopes formed during nuclear reactions :

- (1) Calculate number of neutrons in nucleus of ^{210}Po
- (2) What is the change which occurred in the number of the protons and the neutrons upon the transformation of ^{210}Pb nucleus to ^{210}Bi nucleus ?

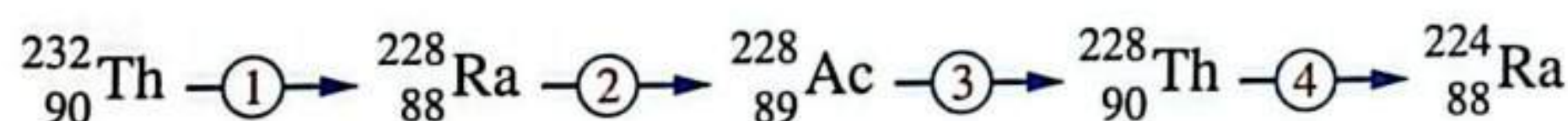
Mention the type of the nuclear reaction.



38 Write the atomic and mass numbers of element (X) in the following equations :

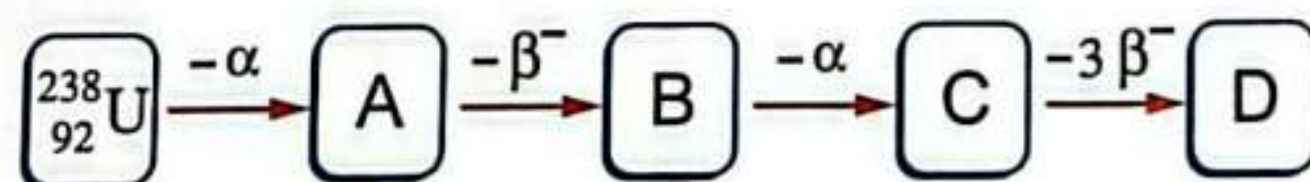
- (1) $^{226}_{88}\text{Ra} \longrightarrow \text{X} + {}^4_2\text{He}$
- (2) $\text{X} \longrightarrow {}^{140}_{58}\text{Ce} + {}^4_2\text{He}$
- (3) $^{95}_{36}\text{Kr} \longrightarrow \text{X} + {}^0_{-1}\text{e}$
- (4) $\text{X} \longrightarrow {}^{233}_{92}\text{U} + {}^0_{-1}\text{e}$
- (5) $\text{X} \longrightarrow {}^{234}_{92}\text{U} + {}^4_2\text{He} + 2{}^0_{-1}\text{e}$

39 Write the nuclear equations that express the nuclear reactions shown in the following decaying serial :



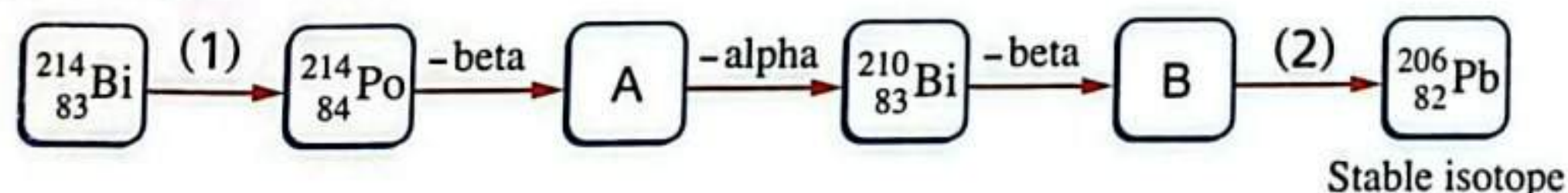
40 What is the change that occurs in the atomic number and mass number of a radioactive element whose atomic number is 88 and its mass number is 226, when it loses 5 α -particles then 4 β^- -particles ?

41 Write the atomic and mass numbers of the elements (A $\longrightarrow$ D) in the following series of a natural radioactive decaying process.



What is the relation between the nuclei of each of D and $^{238}_{92}\text{U}$?

42 In the following scheme :



- (1) Write the mass number and the atomic number of each of the elements (A) and (B).
- (2) Define the type of the emitted particle in each of (1) and (2).

Half-life ($t_{1/2}$)

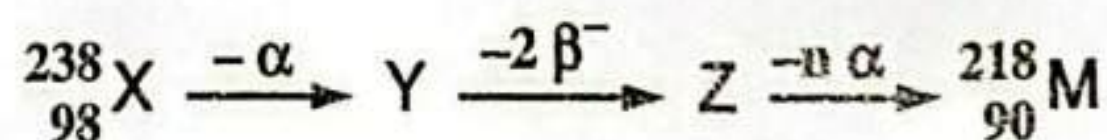
- 43 What is meant by that the half life time of sodium -24 is 14.8 h ?
- 44 The half-life of cobalt -60 is 5.3 years.
Calculate the remaining mass of 1 mg sample of it after 15.9 years.
- 45 A radioactive element, its mass = 24 g and its half-life is 14 years, 93.75% of it decayed.
Calculate the time consumed in this decaying.
- 46 A radioactive substance decays to half its amount after 5 days.
Will it completely decay after 10 days ? Explain your answer.
- 47 1 g of radioactive phosphorus is left for 28 h and 0.25 g of it remained.
Calculate :
(1) Half-life of radioactive phosphorus.
(2) Mass of phosphorus after another 28 hours.
- 48 A radioactive element has half-life 0.5 day, 0.25 g of its original mass remains after 3 days.
Calculate its original mass.
- 49 Explain the mechanism of the smoke alarm.

Higher – order questions

Answered in detail

Choose the correct answer :

- 50 In this series of nuclear reactions :



What is the value of (n) ?

- (a) 3 (b) 4
(c) 5 (d) 6
- 51 In this series of nuclear reactions : ${}_{90}^{238}\text{X} \xrightarrow{(-2\alpha)} {}_E^D\text{Y} \xrightarrow{(-2\beta^+)} {}_B^A\text{Z}$

What is the number of the neutrons in the nucleus of the element Z atom ?

- (a) 140 (b) 142
(c) 144 (d) 146

52 When $^{238}_{92}\text{U}$ nucleus loses 8 alpha particles and 6 beta particles, the ratio $\frac{n}{p}$ in the nucleus of the formed element is

(a) $\frac{60}{41}$

(b) $\frac{61}{40}$

(c) $\frac{62}{41}$

(d) $\frac{61}{42}$

53 In the opposite figure :

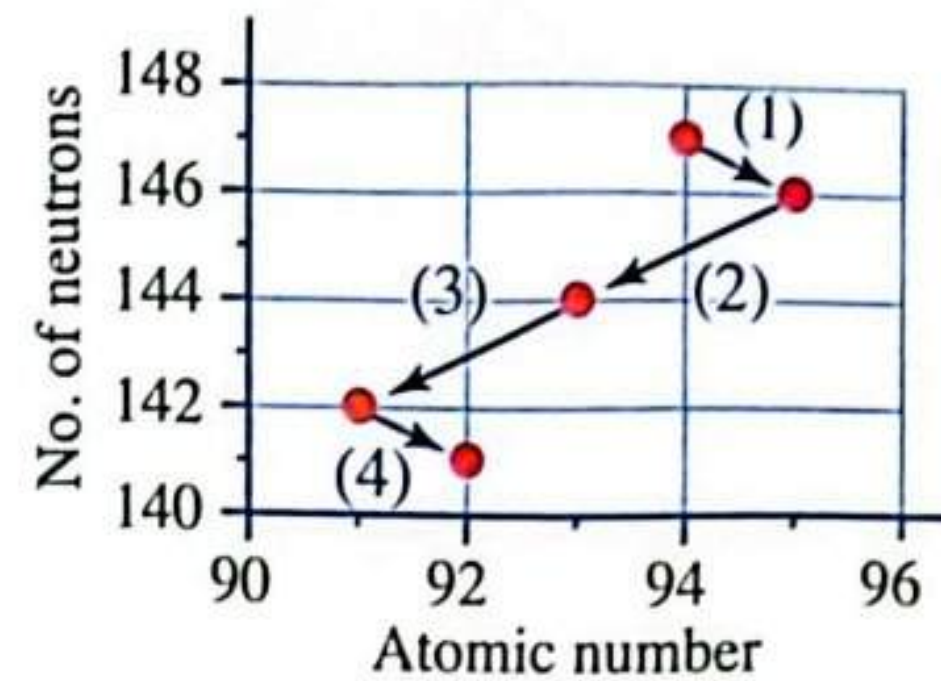
What are the numbers of the arrows which indicate nuclear reactions accompanied by alpha emission ?

(a) (1) and (2).

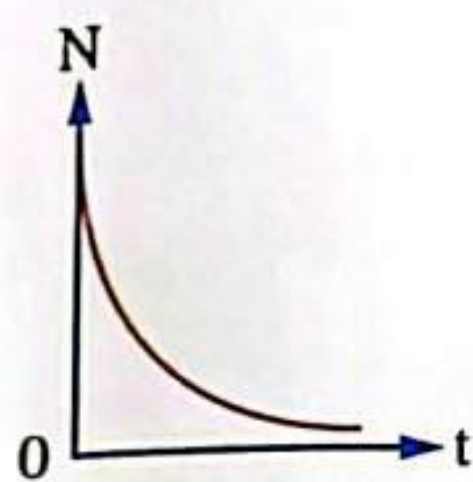
(b) (2) and (3).

(c) (3) and (4).

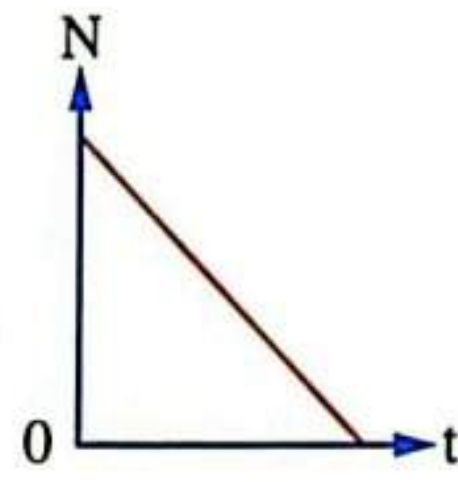
(d) (1) and (4).



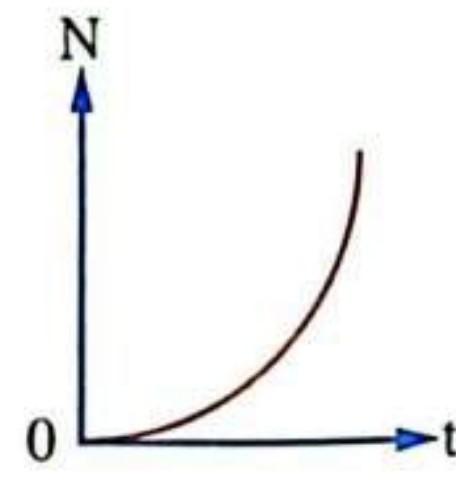
54 Which of the following graphical figures represents the number of radioactive nuclei (N) and the time of their disintegration (t) ?



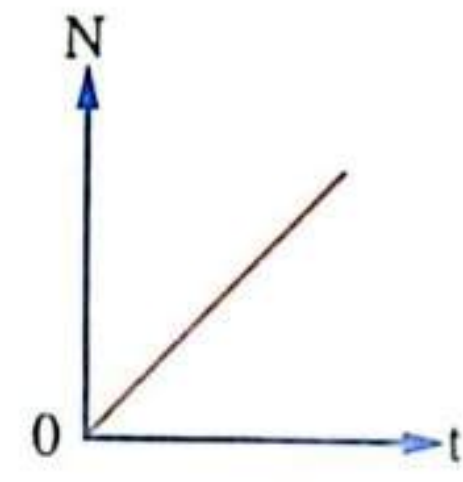
(a)



(b)



(c)



(d)

55 The opposite figure represents the relation between the mass of an element and the time it takes to be transformed into a stable element, if the mass of this element at the beginning was 1 g, and its half-life is 20 days.

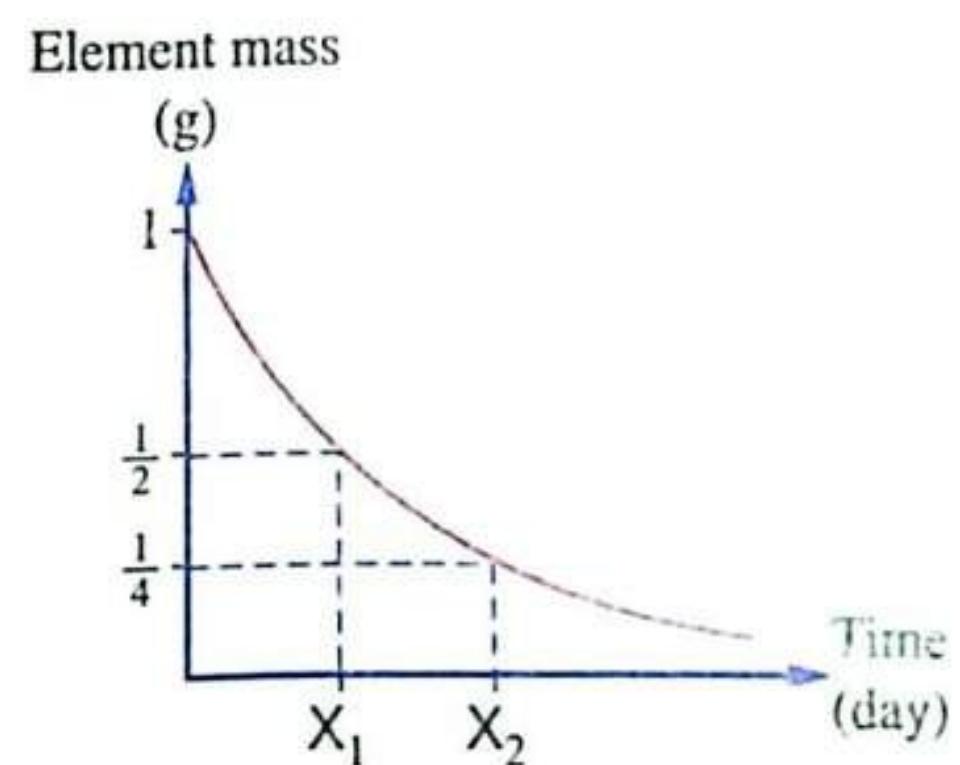
What are the values of X_1 and X_2 ?

(a) X_1 : 20 days / X_2 : 20 days.

(b) X_1 : 20 days / X_2 : 40 days.

(c) X_1 : 40 days / X_2 : 20 days.

(d) X_1 : 40 days / X_2 : 40 days.



كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

اختبار شهر ابريل



Home performance (Week 8)

Q1/ choose the correct answer:-

1. Which of the following represents the electron configuration of the hydrogen ion in lithium hydride?

(a) $1s^1, 2s^1$

(b) $1s^2$

(c) $1s^0$

(d) $1s^2, 2s^1$

2-Which of the following represents the results of the electrolysis of both molten sodium and a sodium chloride solution using graphite electrodes?

	Products of electrolysis of molten (NaCl)		Products of electrolysis of (NaCl _(aq))	
	At anode	At cathode	At anode	At cathode
A	hydrogen gas evolves	Sodium metal is formed	Chlorine gas evolves	Sodium metal is formed
B	Sodium hydroxide is formed	Chlorine gas evolves	Sodium metal is formed	hydrogen gas evolves
C	Sodium metal is formed	Chlorine gas evolves	Chlorine gas evolves	Sodium hydroxide is formed
d	Chlorine gas evolves	Sodium metal is formed	Chlorine gas evolves	hydrogen gas evolves

3- In which of the following reactions the gas produced cannot be replaced by oxygen when passed over potassium superoxide in the presence of a catalyst?

(a) Thermal decomposition of sodium bicarbonate

(c) Reaction of sodium carbonate and hydrochloric acid

(d) Thermal decomposition of lithium carbonate

(d) Dissolution of lithium nitride in water

4- Which of the following salts has the highest thermal stability?

A) Lithium carbonate

B) Sodium nitrate

C) Potassium carbonate

D) Potassium nitrate



5- Which of the following refers to an alkali metal that reacts with nitrogen gas?

- (a) An element used in the manufacture of smartphone batteries
- (b) An element used in the manufacture of lamps that produce yellow light
- (c) An element 90% of whose production is used in the fertilizer industry
- (d) An element used in the manufacture of scratch-resistant glass

6- Which of the following represents the correct order of chemical processes required To obtain sodium sulfate from sodium metal?

- (a) Passing chlorine gas over sodium metal – Electrolysis of the resulting melt – Passing The resulting gas through sulphuric acid.
- (b) Reaction of sodium with oxygen gas – Dissolving the product in water – Passing CO_2 Gas through the product
- (c) Reaction of sodium with hydrogen gas – Dissolving the product in water – Passing CO_2 gas over the product
- (d) Passing chlorine gas over sodium metal – electrolysis of the resulting solution – Adding sulphuric acid

7- Water hardness can be removed by precipitating dissolved magnesium and calcium ions in the form of salts:

- a) Hydroxides
- b) Sulphates
- c) Carbonates
- d) Nitrates

8- Which of the following describes the preparation of a deliquescent substance?

- a) Electrolysis of molten sodium chloride
- b) Reaction of sodium hydroxide with nitric acid (HNO_3)
- c) Passing carbon dioxide gas through a sodium hydroxide solution
- d) The reaction of sodium hydroxide with sulphuric acid

9- Which of the following does not represent a use of potassium metal?

- a) Fertilizer production
- b) Photoelectric cells
- c) Self-contained breathing apparatus
- d) Night vision devices

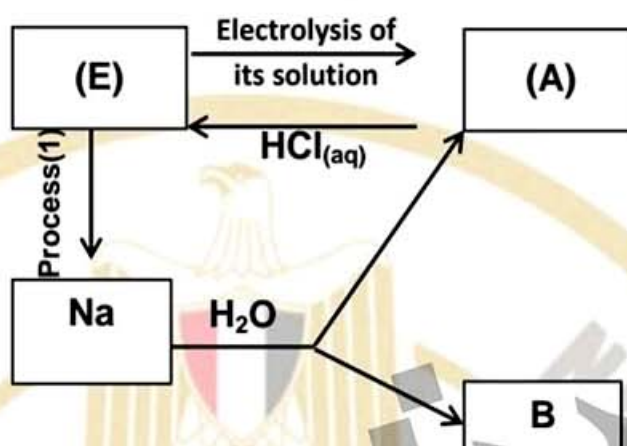
10- Which of the following produces a gas used as a reducing agent?

- a) Dissolving lithium nitride in water
- b) Dissolving sodium hydride in water
- c) Thermal decomposition of potassium nitrate
- d) Thermal decomposition of lithium carbonate



A

Q1/ Study the diagram below, then answer the following questions:



1- Write the chemical formula for compound (E)

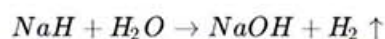
$NaCl$ (Sodium chloride)

2-Write the chemical formula of the compound shown in the diagram

$NaOH$ (Sodium hydroxide)

3-show by chemical equation how you can obtain (B) from sodium hydride

Sodium hydride (NaH) reacts vigorously with water to release hydrogen gas:



Q2/ Choose the correct answer:

1- Which of the following is a deliquescent substance (one that absorbs water vapor and dissolves in it)?

A) Gunpowder salt

B) Chilean saltpeter

C) Washing soda.

D) Halite

2- Which of the following substances reacts with acids and is accompanied by Effervescence (acidity Test)?

a) Sodium hydroxide

b) Sodium carbonate

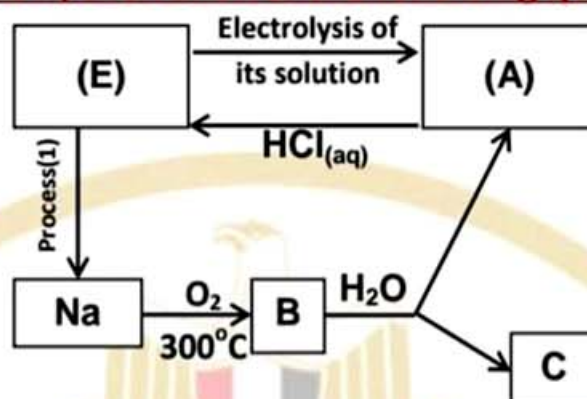
c) Sodium oxide

d) Lithium oxide



B

Q1/ Study the diagram below, then answer the following questions:



(1) Write the name of process (1) in industry

The industrial process for extracting Sodium metal from molten Sodium chloride is the Downs process.

(2) Write the chemical formula for a compound that can be used as a Strong oxidizing agent

Na_2O_2 (Sodium peroxide)

(3) Which of the substances in the diagram is used as a coolant in nuclear reactors?

Liquid Sodium (Na)

Q2/ Choose the correct answer:

1- Which of the following refers to a substance capable of absorbing water vapor And binding with it (Hygroscopic)?

- a) Sodium hydroxide
- b) Sodium nitrate
- c) Sodium carbonate
- d) Sodium chloride

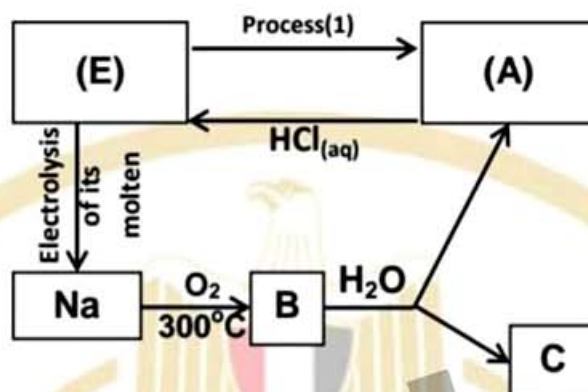
2- Which of the following metals forms alloys with aluminum that is used in the Manufacture of aircraft structures?

- a) Potassium
- b) Rubidium
- c) Cesium
- d) Lithium



C

Q1/ Study the diagram below, then answer the following questions:



(1) Write the chemical formula for compound (C)

..... Sodium Peroxide (Na_2O_2).

(2) Write the name of process (1)

..... Electrolysis of sodium chloride solution

(3) Show by chemical equation how you can obtain washing soda from compound (A)

..... Washing soda is obtained by passing Carbon Dioxide through Sodium Hydroxide (Solvay process or direct carbonation):

Q2/ Choose the correct answer:



1- Which of the following is a deliquescent substance substance (one that absorbs water vapor and dissolves in it)?

- a) Sodium nitrate
- b) Potassium nitrate
- c) Sodium carbonate
- d) Sodium chloride

2- Which of the following metals has a halide used in night vision devices?

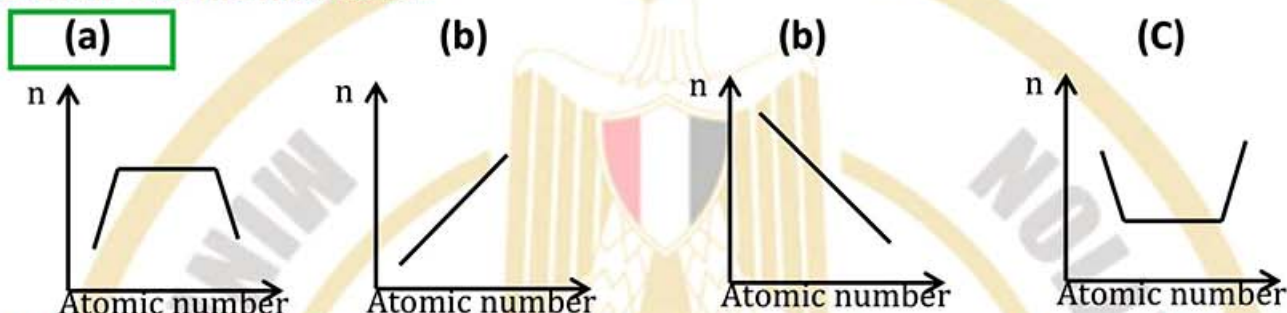
- a) Potassium
- b) Rubidium
- c) Cesium
- d) Lithium



Home performance (Week 9)

Q1/ choose the correct answer:-

1- Which of the following figures represents the relation between numbers of atoms (n) in the gaseous molecules of elements of group (5A) and their atomic numbers?



2- Which of the following represent the correct order for preparing a gas inter the structure of amino acids?

- (a) Heat saltpeter – add dilute hydrochloric acid – collect the gas by downward Displacement of water
- (b) Heat saltpeter – add dilute sulphuric acid – collect the gas by upward Displacement of air
- (c) Heating Chilean saltpeter – adding ammonium chloride solution and heating – Collect the gas by downward displacement of water
- (d) Heating Chilean saltpeter – adding ammonium chloride solution and heating – Collect the gas by downward displacement of air

3- (Z, Y, X) Three colorless gases

X: Produced by heating ammonium chloride with calcium hydroxide

Y: Produced by heating ammonium chloride with sodium nitrite

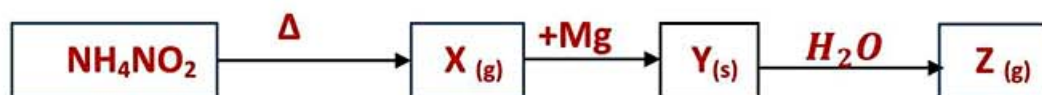
Z: Produced by the reaction of gas (Y) with oxygen at 3000°C

- Which of the following options describes the methods for detecting each of the Gases (Z, X) individually?

- (A) X: Passing it through a red litmus solution , Z: A burning splint
- (B) X: Passing it through a solution of blue litmus paper , Z: Exposing it to air
- (C) X: Exposing it to glass rod wet with hydrochloric acid , Z: A burning splint
- (D) X: Exposing it to glass rod wet with hydrochloric acid , Z: Exposing it to air



4- From the following diagram:



- Which of the following represents (X) and (Y)?

- (A) X: gas used in the Haber-Bosch process to produce ammonia
Z: colorless, odorless gas used in the production of fertilizers
- (B) X: gas has a neutral effect on litmus solution and highly soluble in water
Z: gas formed by replacing magnesium with lithium in the diagram
- (C) X: gas has a neutral effect on litmus solution and insoluble in water
Z: gas that is highly soluble in water and has an alkaline effect on litmus solution
- (D) X: relatively chemically inert gas that reacts at high temperatures
Z: has an alkaline effect on litmus solution and can be dried with sulfuric acid

5- All of the following chemical reactions produce a gas that forms white fumes When exposed to a glass rod wet with hydrochloric acid, except:

- (a) The dissolution of magnesium nitride in water
- (b) Heating a mixture of ammonium chloride and slaked lime
- (c) The thermal decomposition of ammonium nitrite.
- (d) The thermal decomposition of ammonium hydroxide

6- Which of the following does not represent the correct sequence of chemical Processes for preparing nitrogen fertilizer?

- (a) Heating a mixture of sodium nitrite and ammonium chloride solution – reaction With oxygen under suitable conditions – reaction with nitric acid
- (b) Heating a mixture of sodium nitrite and ammonium chloride solution – reaction With hydrogen under suitable conditions – reaction with nitric acid.
- (c) Heating magnesium metal with nitrogen gas – dissolving the product in water – Reacting with phosphoric acid.
- (d) Heating a mixture of calcium hydroxide and ammonium chloride – passing the Product over calcium oxide – reaction with sulphuric acid.

7- Which of the following explains why a retort with a glass stopper is used When preparing nitric acid in the laboratory?

- (a) The resulting nitric acid is a volatile gas that can only be condensed inside the retort
- (b) Nitric acid vapors are a strong oxidizing agent that cause rubber stoppers to corrode.
- (c) The glass-stoppered flask increases the reaction rate between potassium nitrate And sulfuric acid.
- (d) Nitric acid decomposes upon heating into oxygen and water if it is not prepared in a retort



8- Which of the following describes a method for obtaining a fertilizer containing Two elements from Group (A5)?

- (a) The reaction of the gas produced by dissolving lithium nitride with sulphuric acid.
- (b) The reaction of the gas produced by the thermal decomposition of nitric acid with Phosphoric acid
- (c) The reaction of the gas produced by heating ammonium chloride with sodium Nitrite and sulphuric acid
- (d) The reaction of the gas produced by heating ammonium chloride with slaked lime And phosphoric acid

9- Study the following diagram and then answer:



- If you know that element (X) can be prepared synthetically by fractional Distillation of liquefied air
- Which of the following options represents the oxidation numbers of this element in the previous diagram, in order from (X) $\leftarrow$ (Y)?

- (a) $0 \rightarrow 2+ \rightarrow 5+$
- (b) $1+ \rightarrow 2+ \rightarrow 5+$
- (c) $0 \rightarrow 2+ \rightarrow 4+$
- (d) $1+ \rightarrow 2+ \rightarrow 3+$

10- Which of the following explains the appearance of reddish-brown fumes in a Nitric acid preparation apparatus?

- (a) Heating to a temperature higher than $100^{\circ}C$
- (b) An increase in the amount of nitric acid formed
- (c) Heating to a temperature lower than $100^{\circ}C$
- (d) Using a rubber stopper

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Weekly assessment (Week-9)

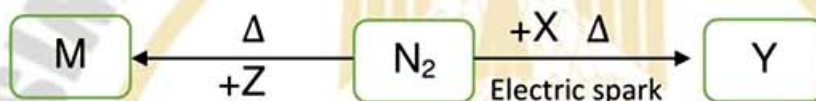
A

Q1/ State the scientific reason: -

- The gas produced by the reaction between ammonium chloride and sodium nitrite collect by displacing water downward, but cannot be collected by displacing air upward?

Q2/ from the following diagram: -

(That gas (M) turns reddish-brown when exposed to air)



1- Mention the name of the industrial method for preparing gas (Y), write the Chemical equation and reaction conditions.

2- Write a chemical equation illustrating the use of (Y) in the preparation of a Fertilizer containing nitrogen that has both positive and negative oxidation states.

Q2/ Choose the correct answer:

1- Which of the following oxides does not react with sodium hydroxide?

- a) Nitrogen pentoxide
- b) Phosphorus pentoxide
- c) Arsenic pentoxide
- d) Bismuth pentoxide

2- Which of the following compound solutions is the strongest base?

- a) Arsine (AsH_3)
- b) Phosphine (PH_3)
- c) Ammonia (NH_3)
- d) Stibine (SbH_3)

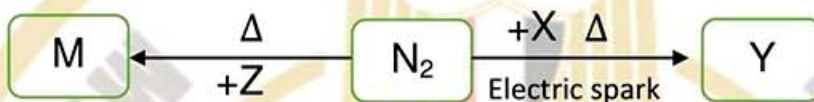


Q1/ State the scientific reason: -

- Reddish-brown fumes appearing in the nitric acid preparation apparatus in the Laboratory.

Q2/ from the following diagram: -

(That gas (M) turns reddish-brown when exposed to air)



1- Write a chemical equation showing the production of gas (Z) from nitric acid.

2- Write a chemical equation showing the use of (Y) in the preparation of a fertilizer containing two elements from Group 5A.

Q2/ Choose the correct answer:

1- Which of the following oxides react with acids?

- a) Nitrogen trioxide
- b) Phosphorus pentoxide
- c) Arsenic pentoxide
- d) Antimony trioxide

2- Which of the following compound is the highest thermally stable?

- a) Arsine (AsH_3)
- b) Phosphine (PH_3)
- c) Ammonia (NH_3)
- d) Stibine (SbH_3)



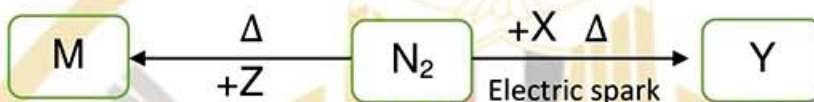
C

Q1/ State the scientific reason: -

- Do not use rubber stoppers when preparing nitric acid in the laboratory.

Q2/ from the following diagram: -

(That gas (M) turns reddish-brown when exposed to air)



1- Write a chemical equation showing the production of gas (Z) from nitric acid.

2- Write a chemical equation illustrating the use of (Y) in the preparation of a Fertilizer containing element from group (6A)

Q2/ Choose the correct answer:

1- Which of the following oxides does not react with acids?

- a) Bismuth pentoxide
- b) Phosphorus pentoxide
- c) Arsenic trioxide
- d) Antimony trioxide

2- Which of the following compound is the least thermally stable?

- a) Arsine (AsH_3)
- b) Phosphine (PH_3)
- c) Ammonia (NH_3)
- d) Stibine (SbH_3)



Home performance (Week 10)

Q1/ choose the correct answer:-

1 - All of the following reactions produce nitric oxide, except:

- a) The reaction of nitrogen with oxygen at 3000°C using an electric arc
- b) Adding copper filings to dilute nitric acid
- c) Adding iron filings to dilute nitric acid
- ☒ d) Adding copper filings to concentrated nitric acid

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2. Which of the following correctly describes the experiment and observation used to distinguish between "diluted nitric acid" and "concentrated nitric acid"?

Experiment	Observation	
	Diluted nitric acid	Concentrated nitric acid
a) Addition of iron	No reaction occurs (Passivity)	Reddish-brown fumes form at the mouth of the tube
☒ b) Addition of iron	Reddish-brown fumes form at the mouth of the tube	No reaction occurs (Passivity)
c) Addition of copper	Reddish-brown fumes form at the mouth of the tube	No reaction occurs (Passivity)
d) Addition of copper	Reddish-brown fumes inside the tube	Reddish-brown fumes at the mouth of the tube

3- Which of the following describes a reaction to obtain oxygen gas?

- a) Adding copper filings to dilute nitric acid and heating
- b) Heating nitric acid to a temperature below 100°C
- ☒ c) Heating nitric acid to a temperature higher than 100°C
- d) Adding copper to concentrated nitric acid and heating

4- Which of the following options represents the correct sequence of chemical Processes to obtain nitrogen dioxide gas from a nitrate salt?

- a) Adding concentrated hydrochloric acid and heating to below 100°C – condensing The resulting vapors – adding water – adding copper filings
- b) Adding concentrated hydrochloric acid and heat to below 100°C – condense the Resulting vapors – add iron filings
- c) Adding concentrated sulphuric acid and heat to below 100°C – condense the Resulting vapors – add copper filings
- ☒ d) Add concentrated sulphuric acid and heat to below 100°C – condense the resulting Vapors – add water – add copper filings



5- Which of the following represents a metal suitable for manufacturing bottles used To store concentrated nitric acid?

- ☒ a) Chromium or aluminum
- b) Copper or aluminum
- c) Iron or copper
- d) Chromium or copper

6-Which of the following uses consume 75%–85% of phosphorus production?

- a) Manufacture of lenses
- ☒ b) Manufacture of fertilizers
- c) Anti-reflective coated glass
- d) Fire detection systems

7- Which of the following oxides is added to wood and fabric products to increase Their fire resistance?

- A) As_2O_3
- B) P_2O_5
- ☒ C) Sb_2O_3
- d) N_2O_5

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8- From the corresponding table:



- Which of the following represents (X, W)?

- a) (X): Cu, (W): NO
- b) (X): Fe, (W): NO
- ☒ c) (X): Cu, (W): NO_2
- d) (X): Fe, (W): NO_2

9- "The use of one of the elements in Group VA has been banned in the pesticide Industry in some developed countries since the 1970s."

-Which of the following describes a recent use of a compound of this element?

- ☒ a) The manufacture of flexible solar panels
- b) Wood preservation and protection
- c) Increasing wood's resistance to combustion
- d) Fire detection systems

10- Which of the following does not describe a property of nitric acid?

- a) It reacts with elements follow hydrogen in the chemical activity series
- b) It reacts with elements above hydrogen in the chemical activity series
- ☒ c) Its diluted state dissolves iron and releases a gas that ignites with a pop sound
- d) Its concentrated state dissolves copper and releases reddish-brown fumes



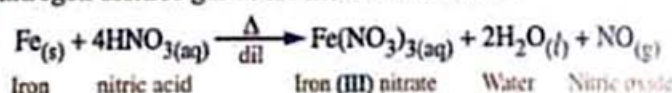
Weekly assessment (Week-10)

A

Q1/ State the scientific reason: -

1- Iron displaces hydrogen from dilute nitric acid, and no hydrogen gas is Released?

Dilute nitric acid reacts with iron, forming iron (III) nitrate with the liberation of nitric oxide gas (colourless) which turns into reddish brown vapours of nitrogen dioxide gas at the mouth of the tube.

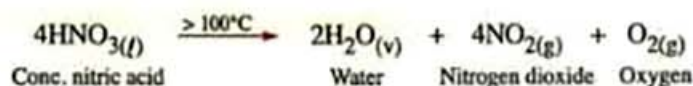


2- Bismuth-tin alloy is used in fire detectors?

because it melts at

temperature less than 100°C.

Q2/ Explain, using a balanced chemical equation, how oxygen gas can be Obtained from nitric acid.

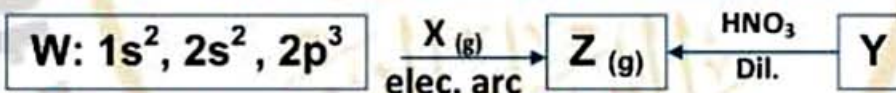


Q3/ Choose the correct answer:

ion of nitric acid with metals

1- From the following diagram: -

-Given that gas (Z) is a nitrogen oxide in the (2+) oxidation state.



- Which of the following options represents (X, Z, Y)?

- a) X: O₂ , Z: NO , Y: Fe
- b) X: O₂ , Z: NO₂ , Y: Cu
- c) X: N₂ , Z: NO , Y: Cu
- d) X: N₂ , Z: NO₂ , Y: Fe

2-Which of the following metals produces reddish-brown fumes when reacted With concentrated nitric acid?

- a) Al
- b) Cr
- c) Cu
- d) Fe

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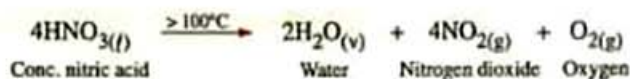


(4) Concentrated nitric acid does not affect some metals which precede hydrogen in reactivity series **such as** (iron, chromium and aluminum).. **G.R** ? Because the nitric acid is a strong oxidizing agent, so a non-porous protective layer of the metal oxide is formed on the surface of the metal which prevents further reaction, what is known as **chemical passivity**.

1- The reaction between concentrated nitric acid and iron stop after a Short time?

Because oxygen gas evolves as a result of its thermal decomposition (above 100°C).

2-Nitric acid is an oxidizing agent:

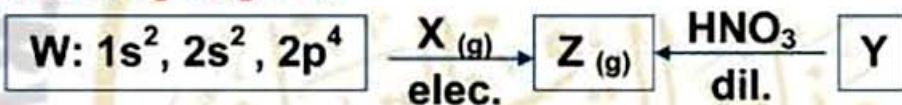
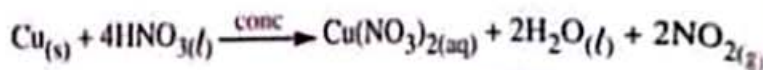


Q2/ Explain, using a balanced chemical equation, how nitric oxide gas can be Obtained from nitric acid.

- Concentrated nitric acid reacts with copper, so reddish brown vapours of nitrogen dioxide gas are formed.

Q3/Choose the correct answer:

1- from the following diagram: -



If you know that gas (Z) is one of the nitrogen oxides in its (2+) oxidation state

1-Which of the following options represents (X, Z, Y)?

- a) X: O₂, Z: NO, Y: Cu
- b) X: O₂, Z: NO₂, Y: Fe
- c) X: N₂, Z: NO₂, Y: Fe
- d) X: N₂, Z: NO, Y: Cu

2-Which of the following metals react with concentrated and dilute nitric acid?

- a) Al
- b) Cr
- c) Cu
- d) Fe

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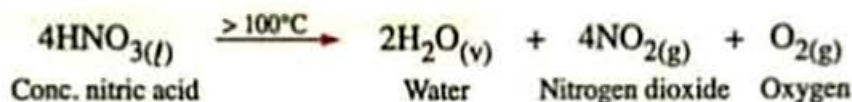
Q1/ State the scientific reason: -

1- The use of arsenic in wood preservation decreased?

1- Due to its toxicity

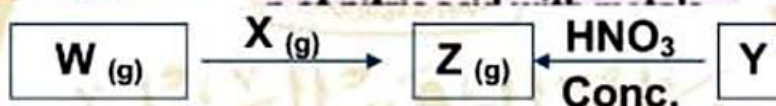
2- Nitric acid reacts with metals that follow hydrogen in the chemical activity series?

Q2/ Explain, using a balanced chemical equation, how nitrogen dioxide gas can be obtained from nitric acid.



Q3/ Choose the correct answer:

1- From the following diagram: -



- If you know that gas (Z) is a nitrogen oxide in the (4+) oxidation state.

- Which of the following represents (W, Z, Y)?

a) W: NO, Z: NO₂, Y: Fe

b) W: O₂, Z: NO, Y: Fe

☒ c) W: NO, Z: NO₂, Y: Cu

d) W: N₂, Z: NO, Y: Cu

2- All of the following elements resist the effects of concentrated nitric acid except:

a) Al

b) Cr

☒ c) Cu

d) Fe

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2 - Because it is strong oxidizing agent which oxidizes the metal forming basic oxide which reacts with the acid



Home performance (Week 11)

Q1/ choose the correct answer:-

1- Which of the following does not describe isotopes of carbon?

- a) They have the same chemical properties
- B) They have the same atomic number
- C) They have the same number of protons
- d) They have the same nuclear reactions**

2- Element $^{127}_{52}\text{X}$, which of the following options represents the nucleus of an Isotope of this element?

	Protons number	Neutrons number	Nucleons number
(a)	52	74	126
(b)	52	75	127
(C)	54	72	126
(d_	50	74	124

3- Three isotopes of the same element (X), one of which has a nucleus containing 19 protons, the second has a nucleus containing 21 neutrons, and the third has a nucleus containing 39 nucleons.

-Which of the following options represents the isotopes of element (X)?

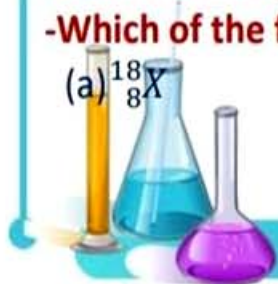
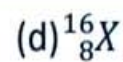
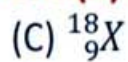
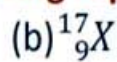
(a)	$^{39}_{21}\text{X}$	$^{39}_{20}\text{X}$	$^{39}_{19}\text{X}$
(b)	$^{39}_{19}\text{X}$	$^{40}_{19}\text{X}$	$^{41}_{19}\text{X}$
(C)	$^{39}_{21}\text{X}$	$^{40}_{20}\text{X}$	$^{41}_{19}\text{X}$
(d)	$^{41}_{19}\text{X}$	$^{40}_{19}\text{X}$	$^{39}_{19}\text{X}$

4- Which of the following is not affected by an electric field?

- (a) Gamma rays and beta particles
- (b) Beta particles and alpha particles
- (c) Helium atoms and gamma rays**
- (d) Alpha particles and helium atoms

5 – Given that the nuclear binding energy of element (X) = 123.823 MeV and the nuclear binding energy per nucleon = 7.739 MeV

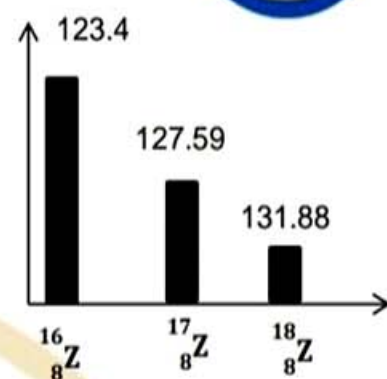
-Which of the following represents element (X)?



6-The following graph illustrates the relationship Between nuclear binding energy and the number Of nucleons in isotopes of element (Z).

-Which of the following statements is true?

- a) The nucleus of $^{17}_8Z$ is less stable than that of $^{18}_8Z$
- B) The nucleus of $^{16}_8Z$ is less stable than that of $^{18}_8Z$
- C) The nucleus of $^{18}_8Z$ is more stable than that of $^{16}_8Z$
- d) The nucleus of $^{17}_8Z$ is less stable than that of $^{16}_8Z$



7- If you know that the mass defect of an element's nucleus is 0.02 u, then the nuclear binding energy of this nucleus is:

- a) 18.62 joules
- b) 2.988×10^{-12} MeV
- c) 4.98×10^{-13} Joule
- d) 18.62 MeV

8- Which of the following represents an appropriate measure of nuclear Stability?

- a) Nuclear binding energy
- b) Average nuclear binding energy of the isotopes of the element
- C) Nuclear binding energy per nucleon
- d) The nuclear binding energy of the heaviest isotopes of the element

9- The effect of a magnetic field on gamma (γ) rays is similar to its effect on:

- a) Alpha (α) rays
- b) Beta (β) rays
- C) Neutrons (n)
- d) Protons (p)

10- Which of the following corresponds to a mass-to-energy conversion value of 931 MeV?

- a) 1 kg
- b) 1 gm
- C) 1 u
- d) 1 mgm



Weekly assessment (Week-11)

A

Q1/ State the scientific reason: -

1- Photographic film get damaged when exposed to a uranium compound?

..... due to the emission of invisible radiations (radioactivity) from the element Uranium, which
..... leads to the formation of images or shadows on sensitive photographic plates

Q2/ From the following table:-

Isotope	Atomic number	Atomic mass	Actual mass	BE/A
Isotope (1)	3	6	6.01512	5.07395 mev
Isotope (2)	3	7	7.01600	5.49024

a) Calculate the nuclear binding energy of isotope (1).

30.4437 Mev

b) Which of the two isotopes is less stable?

Isotope (1)

Q3/ Choose the correct answer:

1- The isotopes of hydrogen are identical in all of the following except:

- a) The number of protons
- b) Their chemical properties
- c) All isotopes are equally stable
- d) Their position in the same group of the periodic table

2- Which of the following represents a mass-to-energy conversion value of 10 joules?

- a) 1.11×10^{-16} kg
- b) 1.11×10^{-15} kg
- c) 2.11×10^{-13} kg
- d) 0.0107 kg



B

Q1/ State the scientific reason: -

1- The actual mass of the nucleus is less than the sum of the masses of its constituents.

the reason for the conversion of a part of the matter's mass (the mass defect) into an enormous energy that works to bind the components of the nucleus together; this energy is called 'Nuclear Binding Energy'

Q2/ From the following table:-

Isotope	Atomic number	Atomic mass	Actual mass
Isotope (1)	6	12	11.01512
Isotope (2)	6	13	12.01600

BE/A

83.92 mev

77.94

a) Calculate the nuclear binding energy of isotope (2).

1013.Mev

b) Which of the two isotopes is more stable?

Isotope (1)

Q3/Choose the correct answer:

1-The most stable nucleus is the one in which:

- a) The total nuclear binding energy is as high as possible.
- b) The mass of the protons equals the mass of the neutrons.
- c) The nuclear binding energy per nucleon is as high as possible.
- d) The actual mass equals the theoretical mass

2- Which of the following represents the energy produced by converting 1.11×10^{-13} g into energy?

- a) 5 Joules
- b) 10 MeV
- c) 10 Joules
- d) 5 MeV



Q1/ State the scientific reason: -

1-Gamma particles unaffected when exposed to a magnetic field.

...because it is electrically neutral (or uncharged)

Q2/ From the following table:-

Isotope	Atomic number	Atomic mass	Actual mass
Isotope (1)	12	24	23.01512
Isotope (2)	12	25	24.01600

a) Calculate the mass defect of isotope (2).

...1.8394 u...

b) Which of the two isotopes is more stable?

Isotope (1)

Q3/ Choose the correct answer:

1- Which of the following represents the symbol for an atom of an element whose nucleus contains 5 protons and 6 neutrons?

(a) ${}_5X^{11}$

(b) ${}_6X^{11}$

(c) ${}_5X^{12}$

(d) ${}_6X^{12}$

2- If 1 gram of a substance is completely converted into energy, the

Resulting energy is equal to:

a) 9×10^{10} joules

b) 9×10^{13} joules

c) 9×10^{16} joules

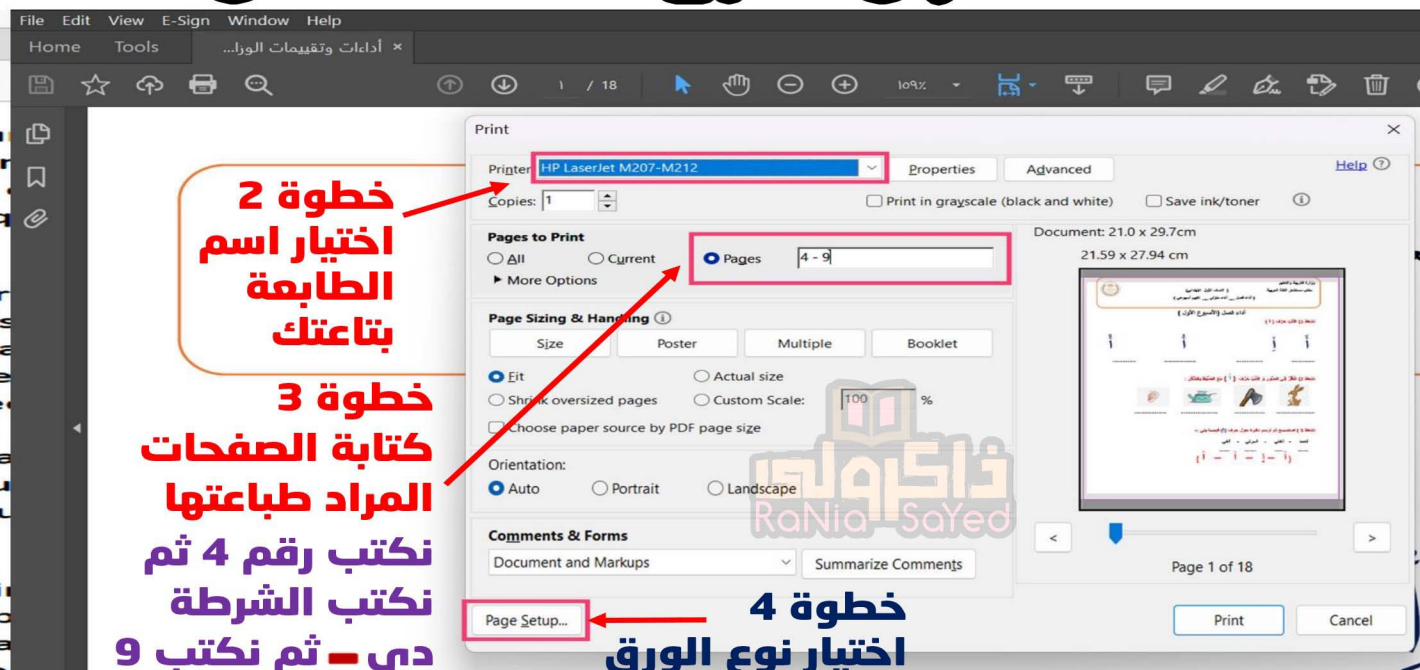
d) 931 joules



كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



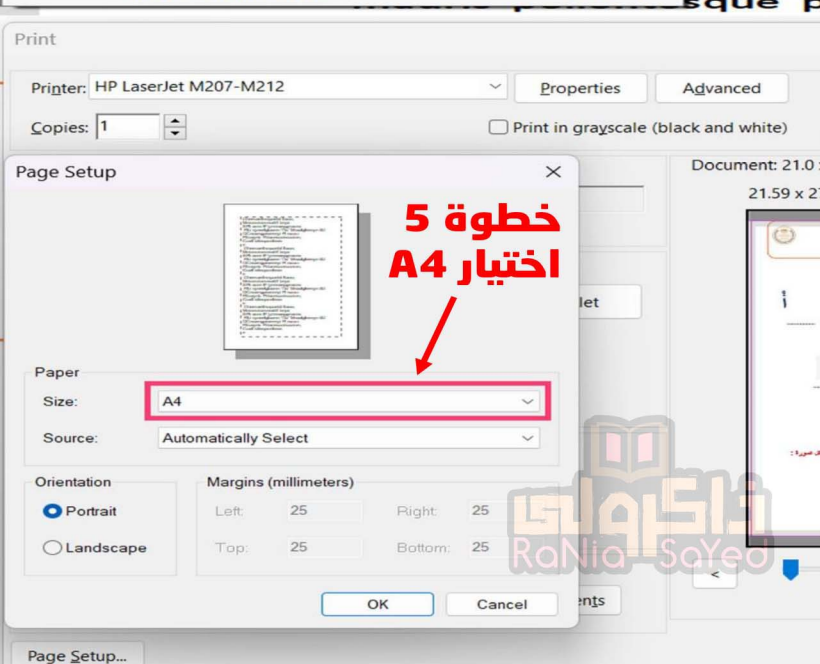
خطوة 1



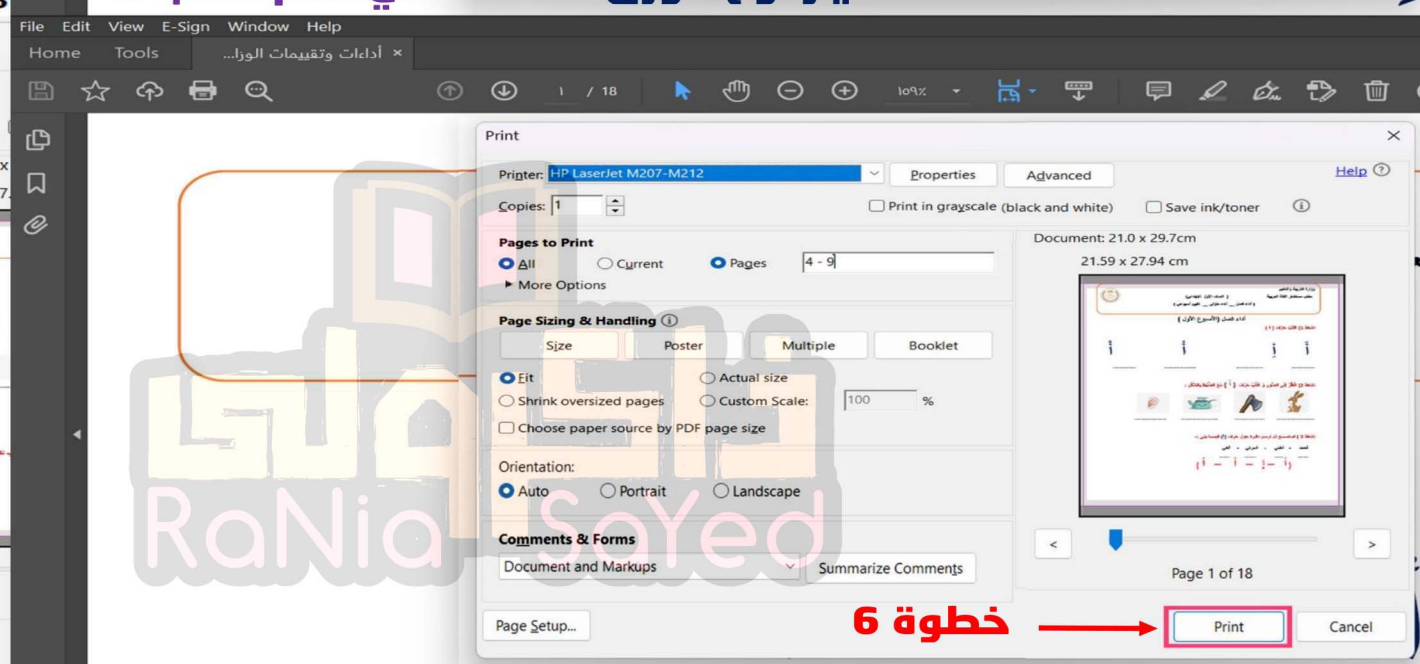
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6